The Chemical Age

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Laboratory's Place in Industry

MR. W. H. COLEMAN, in his article on some features of the modern research laboratory, does well to remind us that, even when the highest standard of equipment has been reached, the real condition of success is the personality and the competence of the staff. This, fortunately, is being realised to an increasing degree by industrial leaders. If the research staff is necessary at all, it is economy to get the very best available, though it may cost rather more than being content with the cheapest that can be got. At the same time, the best staff will be hampered if it has to work with inefficient apparatus and in inconvenient conditions. Here, again, the tendency is to do the thing well if it is to be done at all. Industry is coming to recognise the need of more laboratories, better laboratory conditions, and better laboratory staffs, and all three aspects are part of a common advance in industrial ideas.

In this issue some examples are given of the wide range of laboratory apparatus now available for the most delicate scientific operations. Much of this kind of equipment had formerly to be obtained abroad, mainly from Germany. To-day, the greater portion of the research chemist's needs may be met out of British products, thoroughly trustworthy in quality, and no longer prohibitive in price. One of the best pieces of evidence that could be supplied on the question whether a laboratory pays is supplied by the account on another page of the new laboratories now in course of construction for J. Lyons and Co. It is illustrative of the rapid advance in the research idea that it was not until after the war that this immense firm started a laboratory of their own. Their laboratory proper to-day occupies an area five times its original size. The new laboratory building now being erected in the Hammersmith Road, London, to be occupied about July, will contain no less than 35,000 square feet of space. This enormous extension of their chemical department by one of the largest and most scientifically organised of British businesses seems to settle the question whether a laboratory pays. The experience of Lyons' is the general experience where the work is done as it deserves to be.

A New German Nitrate Enterprise

INFORMATION reaches us this week from an authentic source that capital for an important new German synthetic nitrate enterprise, which will utilise coke oven gas for the manufacture of a wide range of fertilisers, is to be raised almost immediately in New York, under the auspices of Dillon, Read and Co., the well-known American bankers. The new company, which is called the Ruhr Chemical Products Corporation, has been formed by a consortium of 27 of the leading coal and coke companies of the Ruhr, headed by the Vereinigte Stahlwerke A.G. (United Steel Works Corporation), and large plants capable of an annual production of 300,000 tons of synthetic nitrate, compared with a total world production of 695,000 tons, are at present in course of construction. The principal plant at Holton, near the Rhine, will, it is understood, be in operation early next year, and nine months later a second unit is to be started, to be followed later by several others.

The processes used will be the Concordia-Linde and the Casale processes for the production respectively of hydrogen and synthetic ammonia. These processes are stated to be a formidable rival of the Haber-Bosch process used by the I.G. Farbenindustrie. The present surplus of coke oven gas in the Ruhr is estimated at over 9,000 million cubic metres annually, which, if fully utilised, is equivalent to an annual production of 1,800,000 tons of synthetic nitrate, *i.e.*, three times Germany's present output. Other important coke oven gas derivatives include a methyl petrol substitute, and it is intended to produce this on a large scale.

The principal output of the new combine will be a range of fertilisers similar to the Nitrophoska fertilisers of the I.G. Farbenindustrie, and the possibility exists of a price-cutting war between the two great groups. Marketing of the new fertilisers of the Ruhr Chemical Products Corporation, however, will be through the Synthetic Nitrate Syndicate, the corporation which markets for the I.G. Farbenindustrie, and this is regarded as indicative of an attitude of co-operation rather than of competition between the two combines.

Apart from the question of domestic competition between German interests, the scheme raises the problem of how the enormous output of synthetic fertilisers is to be absorbed. Production threatens to increase at a much higher rate than the consumptive capacity, and with any considerable fall in prices not only the by-product industry but the synthetic industry would be seriously affected. These prospects, however, are even more obvious to the heads of these industries than to anybody else, and presumably they know their business.

The Coming of Synthetic Products

MR. C. A. KLEIN, the president of the Oil and Colour Chemists' Association, offered a sound warning to all engaged in the paint and varnish industry when he reminded them at the annual dinner last week that the threat of synthetic indigo was never taken seriously until it was too late. Lord Askwith offered the same advice in only slightly different terms. In an old industry like that of paint and varnish, where it has been the fashion for so long to regard natural products as the only essential raw materials for the industry, there is a natural reluctance to admit the idea that these products may become obsolete. It is possible that they never may become obsolete; one way of preventing this is to know all that is possible about them. At the same time it would be unwise not to recognise the immense strides that are being made in synthetic chemistry and the new competing products that are coming into use. The chemist is the natural watchdog over new developments of this kind, and if the industry wants to avoid being taken by surprise and cut into from new angles, its best plan is to see that its research organisation keeps pace with the fastest chemical advances, and that the commercial body of the industry keeps pace with its chemical advance guard. That, fortunately, is not quite a new idea, but it does no harm to emphasise it, as Lord Askwith and Mr. Klein effectively did at the annual dinner.

The Petrol Tax

IN his Budget speech on Tuesday, the Chancellor of the Exchequer announced the imposition of a tax of fourpence a gallon on "lighter hydrocarbon oils" imported into this country, or derived from imported material. The definition is to include petrol, motor spirit, kerosene, and white spirit. All forms of home production from indigenous products will be free from any countervailing excise duty, the avowed intention of this being to give a stimulus to the production of "Scottish shale oil, benzol, and the liquid fuel manufactured by all the new scientific processes from British coal." In effect, there is protection for a home industry. "This fourpence," said the Chancellor, "will have a very great effect in bridging the gap between the scientific production, which is now perfectly possible, on the large scale of oil from coal and the commercial production which has not yet been achieved." At the moment Mr. Churchill appears to be exhibiting the traditional optimism of all Chancellors, but at any rate this tax can be regarded as some encouragement to the home production of oil. In regard to other aspects of the tax, it would perhaps be safer to await the comments of the motor industry and motor users. The exclusion of heavy oils (*e.g.*, fuel, Diesel, and gas oils), as well as lubricating oils, from the tax, will be hailed with relief by industry. The extension of the duty to turpentine has not yet given rise to any strong comment.

The Calendar

May		
2	Society of Public Analysts.	Burlington House.
2	Royal Society of Arts: "Standardisation of the Elements of Scientific Apparatus, with Special Reference to Teaching." William Taylor. 8 p.m.	John Street, Adelphi, London.
3	Chemical Society. 8 p.m.	Burlington House.
8	Institute of Metals: Annual May Lecture. "The Chemical Properties of Crystals." Professor Cecil H. Desch. 8 p.m.	Storey's Gate, London, S.W.1.
8	Institution of Petroleum Technologists. 5.30 p.m.	John Street, Adelphi, London.
8–18	Society of Chemical Industry: Seven Lectures on Electro-Chemistry by Professor Fichter. 5.30 p.m.	University, Birmingham.
10	The Optical Society: Ordinary Meeting. 7.30 p.m.	Imperial College, London.
10	Oil and Colour Chemists' Association: Annual General Meeting. "Nitrocellulose Lacquers." H. Hepworth.	30, Russell Square, London.
11	Physical Society. 5 p.m.	Imperial College, London.
11	Chemical Engineering Group. Annual General Meeting and Dinner. "Some Chemical Engineering Aspects of the Fine Chemical Industry." F. H. Carr.	London.
12	Bio-chemical Society. Inspection of the new Bio-chemical Department at the University. 11.45 a.m.	Birmingham.
14	Society of Chemical Industry: "The Fuel Industries and the Work of the Chemical Engineer." Sir Arthur Duckham. "Water Purification." Sir Alexander Houston.	London.
15	Addresses by Sir Alfred Mond and Sir John Russell.	—
15	Society of Chemical Industry: "Billingham." Lt.-Col. G. P. Pollitt.	London.
17	Chemical Society. 8 p.m.	Burlington House.
25	Society of Chemical Industry (Glasgow Section): Address by Principal Sir J. C. Irvine.	St. Andrews, Glasgow.
25	Physical Society. 5 p.m.	Imperial College, London.
31	University of London: "Chemical Kinetics." Course of 3 Lectures by Professor Max Bodenstein. 5.30 p.m.	London.
June		
7	Chemical Society. 8 p.m.	Burlington House.
21	Chemical Society. 8 p.m.	Burlington House.

An Orpen Portrait of Sir Ernest Benn

THE ILLUSTRATION ABOVE IS FROM A PHOTOGRAPHIC COPY OF THE PORTRAIT OF SIR ERNEST BENN, BART., C.B.E., CHAIRMAN OF BENN BROTHERS, LTD., WHICH SIR WILLIAM ORPEN, R.A., WAS RECENTLY COMMISSIONED TO PAINT BY THE DIRECTORS, SHAREHOLDERS, AND STAFF OF THE COMPANY, AS A SILVER WEDDING GIFT, AND WHICH IS NOW ON VIEW AT BOUVERIE HOUSE, 154, FLEET STREET, LONDON, E.C.4.

Some Notes on the Modern Research Laboratory

By W. H. Coleman, F.I.C.

In this article, the author, who is chief research chemist to the National Benzole Co., Ltd., deals concisely with the general principles of research, the essential features of a modern research laboratory, the modern laboratory apparatus—largely of British manufacture—now at the disposal of the research worker, and the personal qualities required in a research staff.

THE word research has been considerably overworked of recent years and has often been applied to work on lines of inquiry simply for the sake of providing material for a thesis, and without any ulterior utilitarian object. Now the real meaning of the word research is a seeking after new knowledge that will be of service to mankind either in industry or in the realms of philosophic thought.

The "Scientific Method"

In order that research may be successful, the work of inquiry must be followed out after the fashion called the "scientific method," an expression of somewhat terrifying aspect but one that becomes much less formidable when one considers exactly what it means. It means so controlling the conditions affecting the experiment that one, and only one, is varied at a time. This is the essential point of difference between the earlier and more recent research laboratory, the latter having at command very greatly extended means of control.

In the earlier days of Cavendish, Boyle, Priestley, Gay-Lussac, Davy, Faraday, Liebig and others, apparatus and instruments had to be improvised and often made by the workers themselves, but in modern times the increase in the number of research workers and the increasing complexity of the problems investigated has given rise to the modern industry of scientific apparatus and instrument manufacture, and the research worker of to-day can obtain instruments and apparatus beautifully designed, well made, and of very considerable accuracy.

Essential Features of a Research Laboratory

As this short article is to appear in THE CHEMICAL AGE it will be confined to a research laboratory in which work of a chemical nature is carried out.

The research laboratory itself should be so situated that not only are the workers free from outside interruptions but are ensured entirely healthy and comfortable conditions. These conditions can probably be secured most easily in the suburbs of the larger towns, so that the workers can have access to the scientific libraries generally to be found in such places and are also within reasonably easy reach of the firms who can supply any apparatus and material required.

The design of the buildings will depend to so large an extent upon the nature of the problems to be investigated that it is very difficult to give anything but a general outline of the arrangements most desirable. There are, however, some main points that may be mentioned.

The research laboratory buildings should include a private room for the director of research, and preferably separate laboratories for the chief assistant workers. In addition, there must be a comfortable and convenient library under the control of an efficient librarian, who should have a considerable knowledge of the literature of the subject under investigation and a good knowledge of at least French and German. The library should be supplied with all available books and periodicals having any bearing on the subject under investigation, as well as books of general reference and tables of constants.

The library is the place where the reports of the work done should be written up, and a good deal of time will be saved if the librarian and his staff keep an up-to-date card index of references and also extracts and translations of all special articles relative to the subject in hand that may appear in the press.

There should be a mechanics' shop, having facilities for glass working, in addition to electrical and general engineering work, and staffed by efficient workers capable of carrying out repairs and adjustments as well as making any special pieces of apparatus required.

Laboratory Fittings

The laboratories should be fitted with working benches preferably of well seasoned teak, and supplies of gas, high pressure water, electric current, steam, compressed air, and connection to a vacuum pump should be available at convenient points on the benches. Access to the benches should be obtainable from both sides, and they should not be hampered by shelves for reagents, etc. These should be relegated to the analytical room without which no research laboratory can be considered complete. Provision of suitable drains for carrying away waste, and means of effecting mechanical stirring and shaking, should be easily available. The lighting should be from the North, and means for artificial lighting, and for maintaining a suitable temperature at all seasons, should be provided.

There should also be an ice making and liquid air plant, and suitable and readily available means for extinguishing fires must be provided. A very useful and important addition to any research laboratory is a thermostatic room in which complete control of external temperature conditions can be maintained.

In order to avoid congestion in the working places, it is advisable to provide store rooms under proper supervision and with skilled attendants, where all materials, chemicals, apparatus, etc., can be readily obtained as required, and to which all apparatus, etc. not in actual use can be returned for overhaul and, if necessary, for repairs.

It is by attention to such details as have been referred to that the time of the workers can be economised and their whole attention and mind concentrated on the problem in hand.

British Laboratory Ware

It may be worth while, perhaps, to refer to some of the facilities which are now available, largely due to the conditions set up by the world war. English, or perhaps one should say British-made, laboratory glassware is now obtainable in most respects equal, if not superior, to that formerly only to be got from the Continent. This also applies to nearly all scientific instruments and to a very large extent to the chemicals and other materials required for work.

Modern research workers have at their disposal very many means which were formerly not available at all. To enumerate all, or even the greater number, would be impossible and even uninteresting, but reference may be made to such items as transparent fused quartz vessels now easily obtainable, X-ray apparatus, high power microscopes, efficient vacuum pumps and air compressors, and mechanical devices of many kinds. All the above, and perhaps many other things, are necessary to the successful prosecution of modern research, but one point has been omitted.

All the advantages of a modern research laboratory will be of no avail if there is not the trained research worker. This person—for both sexes are now taking up research work—must not only be highly skilled and well trained in all the manipulations he or she may have to carry out, but must also have an observing eye, a sceptical mind, sound judgment, and last, but not least, a fertile imagination.

Small Laboratory Fittings

USEFUL laboratory "gadgets" are included in the specialities of Andrew H. Baird, the well-known scientific instrument maker, of Lothian Street, Edinburgh. The Universal boss-head clamp consists of two metal blocks, each having a groove on its inner surface. The blocks are separated by a washer and the three are connected by a screw controlled with a wing nut and washer. The clamp admits of a universal movement and clasps rods firmly in any direction. Hyman's burette-reader, which the firm also makes, is designed to eliminate parallax error, and consists of a white and black background for placing behind the burette and a piece of transparent celluloid which goes in front. The device is adjusted until a black line on the background, the edge of the meniscus, and the edge of the transparent celluloid in front are all in one line. Apart from small fittings, Baird's supply various types of scientific lanterns and optical projection outfits, and undertake the fitting up of complete laboratories for chemistry, physics, physiology, etc.

The Chemist's Part in a Great Industry

J. Lyons and Co.'s New Laboratories

The following notes on the general scheme of the new laboratories, now in course of construction for J. Lyons and Co., Ltd., are not only interesting in regard to the equipment, but indicate the important place now given to chemistry in the organisation of what may almost be described as a national industry.

THE Chemical Department of the firm of J. Lyons and Co., Ltd., has had a comparatively short existence, for it was not until after the war that a chemical department was started, the original staff consisting, as was stated in a recent lecture by Mr. S. M. Gluckstein, on "Chemistry and Dividends" (Institute of Chemistry), of a chief chemist, an assistant, a junior, and one clerk. The laboratory, as originally designed, was considered by some to be much too large; it had, roughly speaking, an area of 3,000 sq. ft., and was fitted up in such a manner that the chemist should have every facility to carry out his tasks efficiently and to prove the worth of chemistry in the particular type of industry represented by J. Lyons and Co.

Objects

The object of such a laboratory may be briefly defined as "to ensure the purity of the food served." This is still the main object, but it will be realised that hand in hand with this object go other important considerations, and the work of the department to-day may be classed under the following headings:

(*a*) To ensure the chemical and bacteriological purity of all food supplied, either through tea-shops and restaurants or through wholesale trade.

(*b*) To check the efficiency of all processes of food manufacture employed by the firm.

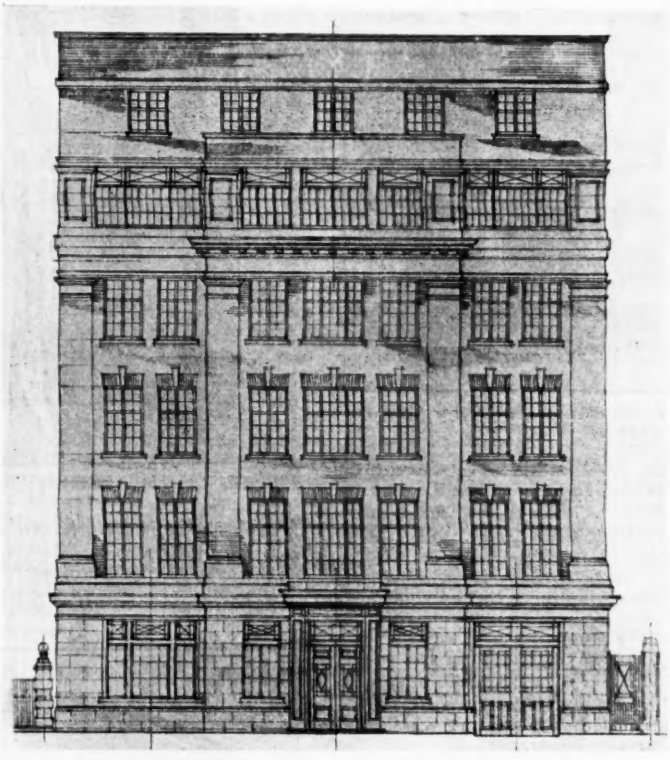
(*c*) To investigate new processes, new machinery and new materials, both raw and finished.

It will therefore be realised that the scope of the work of the laboratory is wide, and sections are at work on such diverse subjects as the control of fuel oil and coal, the bacteriological examination of meats and fish, the testing of linen and paper, the control of milk, ice cream, and kindred products, the treatment of boiler waters and the corrosion of metals, the baking qualities of flours, the packing of chocolates, and so on.

The laboratory proper now has an area about five times its original size, and has also a large process department fitted with experimental machinery, so that the gap between the laboratory experiment and the factory process can be effectively spanned. During the last few years, however, laboratory expansion has had to be curtailed owing to the impossibility of finding space for increased staff, space which could not be obtained at Cadby Hall proper, and so, like other service departments such as engineers, construction, architects, transport, etc., the laboratory has been forced out of Cadby Hall.

The new laboratories now being erected are in Hammersmith Road, almost opposite Cadby Hall, facing the end of Brook Green. The change over will probably not be effected until June or July, but a short description of the building may be of interest. It consists of a basement, ground floor, and five storeys, each roughly 5,000 sq. ft., or 35,000 ft. in all. The basement is given over to the boiler house, which will also serve as an experimental outfit for tests on boiler water treatment, steam production, etc.; a machine shop and instrument makers' shop; electrical sub-station with motor generators for D.C.; a machinery laboratory; experimental confectionery laboratory and experimental essence laboratory.

The ground floor consists of entrance hall, waiting room, dock (for the receipt of goods), oil and fats laboratory, cocoa and chocolate laboratory, and chocolate machine laboratory. On the first floor is situated the general laboratory, which is, roughly speaking, 56 ft. by 36 ft., with its attendant wash-up, general preparation laboratory, balance room, digestion rooms, furnace room, polarimeter room, stores and laboratory office. On this floor, too, one of the chief assistants has his office.



FRONT ELEVATION OF THE NEW LABORATORY.

Many Departments

The second floor houses the baking laboratory and experimental bakehouse, the fuel laboratory, milk products laboratory, the essence laboratory, and the office of the other chief assistant. On the third floor is the microbiological laboratory, the jam and fruit section (consisting of a laboratory and experimental equipment) and the physical chemistry section. On this floor are also two constant temperature rooms. The fourth floor is mainly for administration, although on it is situated the library as well as a textile laboratory. The fifth floor is occupied by the restaurant and kitchen, and the research laboratory.

It may be of interest to know that every floor has its polarimeter room, special digestion rooms, and a balance room.

The building is fitted with an express lift and also with an electric automatic hoist for conveying samples, etc., from one floor to another.

The benches in the laboratories are fitted with D.C. and A.C., with steam, cold water, hot water, vacuum, compressed air, and gas. The building was designed and is being erected by the Construction and Engineering Departments of the firm.

The above account, short as it is, gives some idea of the complicated equipment which is required in order that a laboratory dealing with food products may work with the highest possible efficiency. It is gratifying to find, moreover, that the directors of such a great and prosperous concern are so convinced of the value of chemical methods of investigation.

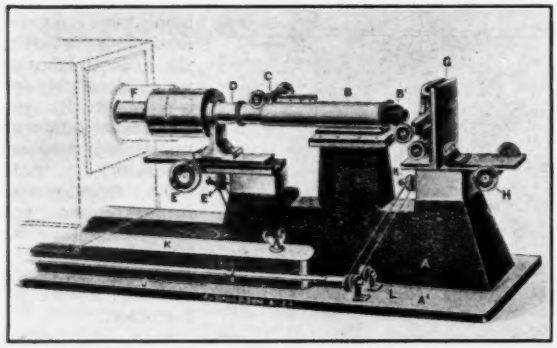
Modern Apparatus and Fittings for the Laboratory

Notes on Recent Products

The following notes have been compiled with a view to calling attention to the equipment which is brought out from time to time by laboratory furnishers, and it is hoped that they will be of assistance to firms considering the establishment of a laboratory.

A Super Microscope for Metallography

In research upon metals, limitations have in the past been set by the limitation of magnification possible with ordinary photomicrographic apparatus, and photographs of metal sections of above 1,500 diameters have not been frequently obtained. The necessity for a greater magnification than this is particularly evident in work on alloy steels. Bearing this in mind, Dr. F. Roger set out some years ago to investigate the possibilities of the "super-microscope" system. The principle of the system consists in replacing the usual eye-piece by a microscope, known as the secondary, which procedure is made practicable by the interposition of a specially designed lens, called the collector. Photography is thus performed with the three lenses, the primary objective, the collector, the secondary objective, and in some cases with the addition of an eye-piece.

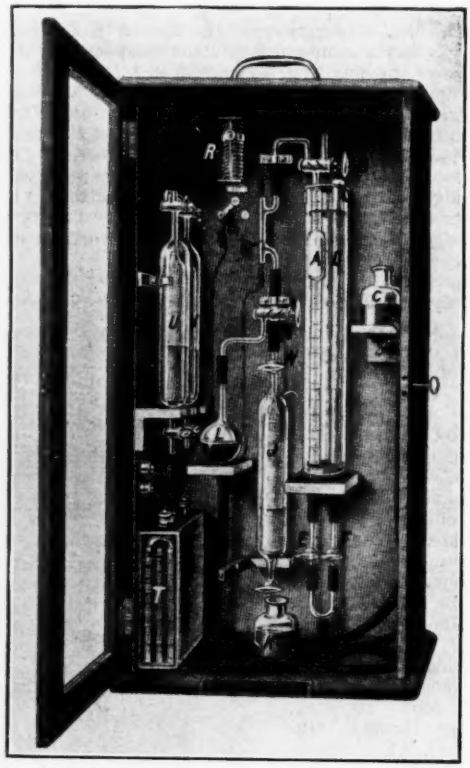


THE "DAVON SUPER-METALAB" MICROSCOPE FOR METALLOGRAPHY.

The collector is in general use closer to the objective than the field lens of an eyepiece. Its design is such that the primary image formed above the collector is lower than in the ordinary microscope. The secondary microscope lends itself to being made to a high grade design, and in this respect is more advanced than the eye lens of an eyepiece. An apparatus either for observation or for photography, on the lines indicated above, has been made by F. Davidson and Co., manufacturing opticians, of London, under the name of the "Davon Super-Metalab" super microscope for metallography. The object aimed at has been the production of a complete apparatus suitable for the most exacting requirements of research work, both in academic and modern factory laboratory conditions. The instrument is shown in the illustration, D, being the secondary microscope, F, the eyepiece of the secondary. The instrument is tested for precision at a magnification of 4,000 diameters.

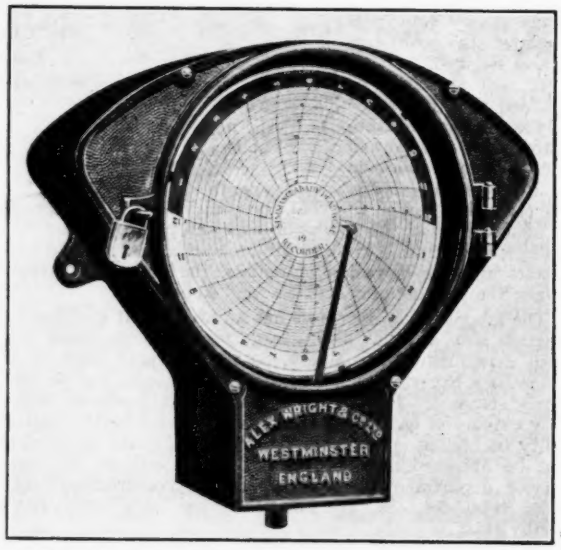
Gas Analysis and Pressure Recording

Instruments of all kinds for gas analysis are made by Alexander Wright and Co., Ltd. These include testing recording gas calorimeters, total heat gas calorimeters, Boys' gas calorimeters, indicating calorimeters. The range includes Dr. Leonard Levy's portable apparatus for the complete examination of gaseous mixtures. The instrument has now been on the market for some time and has been designed to fill the need for an accurate and portable apparatus for the complete examination of gaseous mixtures. The use of the silica-platinum combustion capillary tube has enabled the bulk of the apparatus to be reduced. The difficulties associated with the estimation of carbon monoxide by absorption with cuprous chloride are entirely obviated, carbon monoxide as well as hydrogen being estimated by oxidation. This reduces the absorption pipettes to two. A complete estimation can be made in less than an hour. Apparatus for the estimation



DR. LEVY'S APPARATUS FOR GAS EXAMINATION.

of naphthalene in gas by Colman and Smith's method is also made, this method being based on the removal of naphthalene by picric acid. The Roland Wild pattern solid fuel bomb calorimeter is another of the firm's productions. The firing of this apparatus is by hot wire or by electrical ignition.



THE SIMMANCE DEAD BEAT PRESSURE RECORDER.

Apart from gas analysis apparatus, the firm supplies many vacuum and gas recording instruments. Simmance's dead beat recorder records on a chart any gas, air, steam or water pressure from one millimetre up to 300 lbs. per sq. inch. A similar instrument is the Simmance dead beat indicator. A recent introduction is the CO_2 and draught indicator and recorder, an instrument which, in addition to recording both draught and CO_2, indicates them on a large open scale.

Bench and Cupboard Units

The complete fitting of laboratories of every description is undertaken by A. Gallenkamp and Co., Ltd., of Sun Street, London. If desired they can include gas and water connections, wastes, vacuum compressed air, electric and ventilation installations for educational and industrial purposes. Alterations or enlargements of existing laboratories can also be carried out on modern lines. In addition to the ordinary type of laboratory bench they specialise in a Standard Type Bench, namely, the "Technico" unit system. There are distinct advantages in this pattern as they enable the user to fit together the various units as required. These are made in the double or single unit. The dimensions of the double unit are 3 ft. wide, 1 ft. 9 in. deep, 2 ft. 11 in. high, overall, and the exterior wood work and sides are of polished oak with cupboard and shelf with two doors fitted with turnbuckles, two drawers 4½ in. deep with oak sides and runners (polished) with bronzed pulls. For the special use of either single or double unit, plates are supplied for screwing on top. Being of standard dimensions these units are stocked and thereby offer distinctive advantage in delivery, and they are supplied already with connections for gas, water, etc. They can be connected by any plumber. In addition to the aforegoing there are two further specialities of decided interest to chemists and these are namely, "Technolite" and "Asbestolite." "Technolite" is a material as hard as crystal and possesses a brilliant fire-polished surface, which acids or alkalies cannot stain. Also it can be kept scrupulously clean and sterile with a minimum amount of trouble. This is cast in sheets up to 108 in. by 40 in. in thicknesses from ¼ in. to 1 in. Edges can be cut and bent to avoid sharp angles, and also can be drilled to take fittings, and bevelled and polished. This is highly suitable for bench or table tops, etc., for bacteriological work and laboratories for testing foodstuffs. "Asbestolite" offers similar advantages to the above. This is used in laboratories for bench tops which are subject to great heat. It is tough and strong, will retain screws, can be worked easily, and does not flake and is resistant to acids, heat, etc. It is a good substitute for slate where surface heat is liable to crack. This is supplied to order from ⅛ in. to 1¼ in. thick.

Electrical Determination of Ash Content of Sugar

THE proportion of mineral substance, or ash content, of sugar products is of material importance to the sugar producer and refiner. Insoluble substances are not of much significance in refining, but soluble mineral substances effect economy of production and the recovery of sucrose. Chemical methods of ash determination take considerable time if the highest degree of accuracy is to be obtained so that it is interesting to note that an electrical bridge method has been evolved with, it is claimed, at least as high a degree of accuracy as by chemical methods, but with a considerable saving of time. The method is based on the fact that aqueous salt solutions will conduct electricity. Since the mineral matters comprising the true ash content of a sugar product are salts soluble in water, the ash content of a sugar product can be determined by measuring the conductivity of a water solution of the product, if the relation between conductivity and the concentration of the salts is known. The Leeds and Northrup sugar ash bridge, comprising an A.C. Wheatstone bridge and a cell for the solution, measures directly the conductivity of solutions. The methods consist in the preparation of a solution of known specific gravity, a portion of which is poured in the glass cylinder of the conductivity cell. The electrodes are immersed in the solution, connected to the bridge, which is connected to a supply of 110 volts 60 or less cycles. When the bridge is balanced, the reading of the scale on the slide wire is multiplied by 1, 10, 100, 1,000 or 10,000 according to the position at which a plug on the top plate was set when

LEEDS AND NORTHRUP SUGAR ASH BRIDGE.

measurements were made. This shows directly the specific conductance of the solution. The sugar ash content is read off on a table showing the relation between the conductivity and ash content. Duplicate determinations are stated to agree within a fraction of 1 per cent.

Recording Thermometers

"TELE-THERMOGRAPH" distance recording thermometers are the production of the Accurate Recording Instrument Co., Ltd., of Teddington, the makers of various recording and indicating thermometers. These instruments are guaranteed to be accurate to within 1° C. "Accurate" glass thermometers for chemical laboratory and industrial work are also made, and are supplied with N.P.L. certificates if desired. Another firm specialising in thermometers and pyrometers and combustion recording apparatus is the Sarco Co., Ltd. The Sarco bomb fuel calorimeter working on the Mahler-Donkin System enables the calorific value of solid and liquid fuels to be readily ascertained.

Sensitive Chemical Balances

Among the names of balance makers few are better known than that of L. Oertling, Ltd., of London. Standard Oertling chemical and assay balances cover most of the needs of the chemist and metallurgist and, in addition, the firm is always ready to design and build instruments to suit special cases. The No. 7BST is a standard analytical balance taking up to 200 gms. and turning with 0.0001 gms. With the chainomatic balance a sensitivity of 0.0001 gms. is secured without weights or riders below 0.1 gms., by accurate adjustment of a length of fine chain attached to the beam. This is effected automatically without opening the case, readings being taken on one vernier scale.

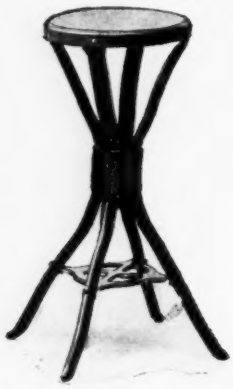
Automatic Switches

VARIOUS types of pressure and temperature operated electric switches are described in a pamphlet received from The Drayton Regulator and Instrument Co., Ltd., West Drayton. The class V Thermostatic Switch is made in transmitting form with a variety of bulbs and is suitable for direct control of refrigerating plant, automatic oil burners and electrically heated ovens. It is supplied in two types: type M employing a mercury switch for control within narrow limits, and QB with quick break metal contacts for use where a wider temperature variation is allowable. For very fine work it is advisable to use the T.C. electric transmitting thermostat, with

which regulation within ½° F. is obtainable. The pressure operated switches are similar to the thermostat switches save that in the place of the bulb and capillary tubing, a pressure connection is provided. These switches are useful for the director control of compressors and pumps.

Petroleum Testing Apparatus

APPARATUS for testing petroleum and its products are specialities of the firm of Townson and Mercer, Ltd., of Camomile Street, London. This shaking apparatus, for the estimation of aromatic content of petroleum, is solidly constructed of oak with a box to take half a dozen 8-oz. bottles. The driving



TOWNSON & MERCER'S STEEL LABORATORY STOOL.

wheel is 12 in. in diameter and power is supplied by a B.T.H. ⅛ h.p. electric motor. Townson and Mercer manufacture a large range of petroleum testing apparatus, including instruments specified by the Institution of Petroleum Technologists and the British Engineering Standards Association. In a different direction the firm can supply steel stools for laboratory use, strongly made of triangular pressed steel. These are supplied in various sizes from 19 to 29 in. in height.

The Science of Water Treatment

IN the super power station, and wherever a large modern plant is installed, either for power or for process steam, attention is naturally given to the chemical state of the water supply. It is realised that the high efficiency for which these plants are designed cannot be maintained without suitable water. Scale and corrosion not only reduce actual working efficiency, leading to higher fuel consumption, but inevitably accelerate the capital depreciation of boiler plant. Besides simple hardness, the presence of various dissolved substances, including gases, must be checked. In fact, the quality of feed water is now realised to be one of the most important factors in the economical raising of steam. Obviously, water testing and treatment should have the same attention, no matter how large or how small the individual plant may be. Occasional rough and ready "hardness" tests cannot give the information necessary to avoid loss through scale and corrosion. Regular and accurate tests on the feed water, both before and after any treatment it may receive, as well as periodical tests of the boiler water itself, are essential to success. No doubt the perfunctory attention too often given to these matters is partly accounted for by the impression that the results obtained are not sufficiently informative unless complete analyses of the water are made.

In an interesting booklet, "Water Testing," Sofnol, Ltd., of Westcombe Hill, Greenwich, show how the essential and accurate information may be obtained in a simple manner. It is now over twenty years since Sofnol, Ltd., began their service to steam users, supplying lime-soda mixtures for water treatment, and apparatus and reagents for water testing. The firm's work naturally involves constant testing of waters of every type, and the rapid and accurate methods and special reagents they have developed make the routine testing of boiler water a simple matter. This booklet (R3) will gladly be sent to any reader interested in boiler plant economy.

Measuring of Hydrogen Ion Concentration

THE method of detecting acidity or alkalinity by means of indicators and the determination by titration are well known, but there are innumerable solutions which cannot conveniently be measured by the titration method. In order to determine the effective acidity or alkalinity of a solution, it is necessary to find out the concentration of the hydrogen or hydroxyl ions. A convincing example is the comparison of hydrochloric acid with acetic acid. Compared in the same normality they need, when applying the titration method, the same amount of alkali for neutralization. On the other hand, if their hydrogen ions are employed for catalytic or fermentative purposes, hydrochloric acid is many times stronger than acetic acid. This points to the necessity for a knowledge of hydrogen ions concentration.

For this purpose various instruments are employed in works and scientific laboratories. Among them may be mentioned that devised by Dr. Peter Wulff, of Munich, the Wulff colorimeter with indicator strips, known as the "Folien Colorimeter nach Wulff." This equipment is simple and handy, so that the determinations can be carried on with accuracy by anyone following a few simple instructions. The accuracy of the determinations is within a p_H value of 0·2. Greater exactness is not required in ordinary works. The p_H determination can be made over the range 2·3 to 9, and this range has been recently extended to 0·1 on the acid side and 12·5 on the alkaline side. A particular advantage claimed is that the Wulff colorimeter is especially valuable for turbid and strongly coloured solutions (inks, etc.), as well as for turbid and colloidal suspensions.

The indicators strips have a length of 3 cm. They are transparent and impregnated with indicators. These strips are exposed to the solution for a matter of 1-2 minutes (during which time the colour of the strip changes), then removed, placed on sliding colour scales and accurately matched up with colour standards on glass slides. There are three series of strips sensitive to different hydrogen ion concentrations and, if the concentration of a solution is not known, it is possible to detect the same by making these tests with the three different series. If the solution is turbid or colloidal, the strips may be rinsed or cleaned by means of distilled water or filtering papers without affecting their accuracy. By this means it is possible to adapt the simple and speedy principle of comparison of colours even where the usual colorimetric methods fail in consequence of the opacity of the solutions used.

The apparatus is patented and can be furnished by the manufacturers, F. and M. Lautenschläger G.m.b.H.

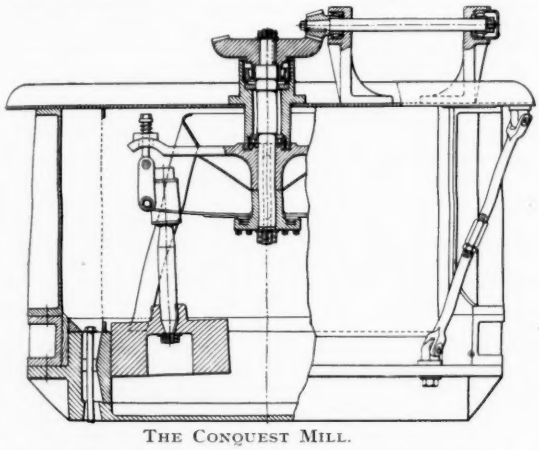
Ring-Roll Type Pulverisers

GRINDING machinery roughly falls into three classes—disintegrators, ball and ball and tube mills, and pulverisers of the ring-roll type. The latter are very popular for the reduction of all hard and refractory materials to powder. In this type the grinding takes place between the faces of a number of rolls and a grinding ring. Over a period of many years, machines of this pattern have met with a large measure of success. Being dependent on centrifugal force for the crushing power obtained, they have hitherto been designed along lines of extreme stiffness and absolute rigidity, which has necessitated the use of large foundations because of the vibration to which their design rendered them subject.

With a view to remedying these defects, the "Conquest" mill has been evolved. This machine, which is the product of the "Conquest" Mill Engineering Co., Ltd., of Craven House, Kingsway, W.C., is shown in the accompanying illustration. In this machine the makers have aimed at isolating the grinding chamber from the drive by the inclusion of a device which absorbs the shocks and jars that arise from the reduction of all hard materials to powder. In the "Conquest" mill a flexible carrier is used, and from this is suspended the roll-heads and shafts. A positive drive is also incorporated, which marks a great advance on grinding practice. The flexible carrier produces a slight rise and fall action on the roll-heads—an action which can be likened to that produced in a pestle and mortar—while pressure between the roll-head and the die-ring is due to centrifugal force alone and there is

no added pressure as the roll-shaft is pivoted and free to move away from or towards the die-ring. A point to be stressed is that this centrifugal force is under control by the variation of the speed of the mill. The action imparted to the roll-heads eliminates the grooving of the die-ring, while chipping of the roll-heads is also eliminated. As a result of the even wear and tear of the grinding faces, maximum output is maintained, whilst maintenance charges are much reduced.

Bearing troubles, which have hitherto proved a difficulty

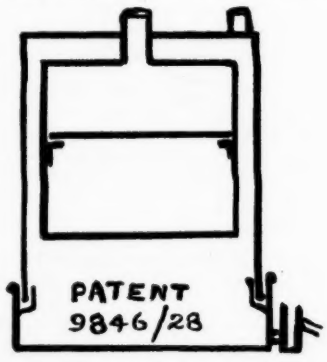


THE CONQUEST MILL.

in this class of machine, have been effectively eliminated, for "Conquest" mills are fitted throughout with Timken taper roller bearings which carry a two-years' guarantee by the makers. These are carried in dustproof housings, whilst lubrication is by the "Tecalemit" grease gun system. In machinery of this class accessibility is of the utmost importance and here the "Conquest" mill reaches a high standard. It is also worthy of note that this machine supplies the finished product to any degree of fineness at one operation, thus obviating the need for any auxiliaries such as screening or separating plant.

A New Laboratory Oven

Brown and Son, Ltd., of 9, Wedmore Street, Holloway, N.19, in conjunction with Dr. Sand of The Sir John Cass Institute, have designed and patented a new type of water jacketed apparatus, which presents the much wanted feature of a readily removable bottom. The novelty consists of a groove or gutter into which the upper part fits. This gutter is sealed with paraffin wax, Wood's metal, or other suitable material or composition. When cold, the seal sets hard, and the apparatus is portable. To remove the bottom for cleaning or renewal, it is only necessary to warm the water, and the

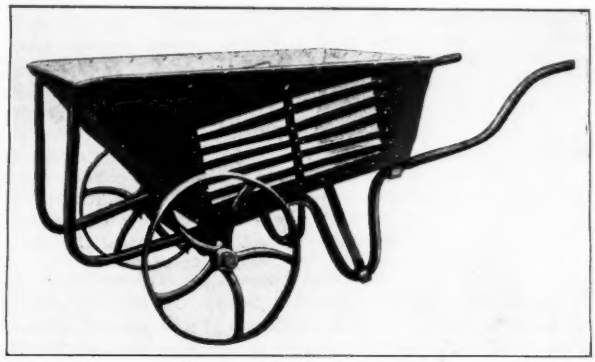


upper part lifts off. The principle is applicable to ovens, water baths, stills, in fact to water jacketed appliances of all shapes and sizes.

It is well known in laboratory practice that water-ovens in particular rapidly become choked with lime deposits, and consequently their bases become burnt and leaky. This new feature will allow of easy and rapid cleaning, and thereby considerably prolong the life of the oven, and when a new base is required it will be unnecessary to return the oven to the makers for patching with solder. At low cost an entirely new base can be sealed on. Apparatus of this design will shortly be placed on the market. Illustrated pamphlets and full particulars are being prepared and will be sent to all interested parties who apply to the firm.

Steel Barrows and Corrugated Sheeting

THE new catalogue of Frederick Braby and Co., Ltd., Glasgow, contains details of many kinds of barrows for use in the chemical, iron, steel and constructional industries. Braby balanced barrows are made from high-grade steel, and are thus extremely strong. Certain types can be supplied with either one or two wheels. Capacities range from two to about ten cubic feet.



A BRABY GASWORKS BARROW.

The illustration shows the Eclipse gasworks tilting barrow, with ribbed sides. These are made from high-grade steel sheets, 12 to 14 gauge, and are mounted on a strong tubular frame. A type of interest to the overseas buyer is the export model, which is supplied in a knock-down condition, and can be assembled in a few minutes. For transport by ship it takes up remarkably little room. Another brochure received from Braby's contains details of the firm's galvanised corrugated iron sheets and corrugated ventilating louvres.

Gas Extensions at Birmingham

New Vertical Retort Installation at Saltley

THERE was inaugurated this week by the Lord Mayor of Birmingham (Aldeman A. H. James) a new continuous vertical retort installation at the Saltley Gas Works. This plant replaces a section of retorts built on the old inclined principle and is designed to give a maximum gas production per ton of coal carbonised at a minimum cost. The new vertical retorts will have a total capacity of 7 million cubic feet of gas per day, compared with the 2½ million cubic feet of the 26 beds of inclined retorts which they displace, and have been erected by the Woodall-Duckham Co., Ltd., at a total cost, including the necessary coal handling and coke screening plant, of £154,000. The carbonising section of the plant consists of 56 8-ton retorts, the coal being fed into the retorts from overhead hoppers. The coal crushing, elevating and conveying plant is capable of dealing with 100 tons of coal per hour, and an entirely new feature in Gas Works practice is the provision of a ferro-concrete coal blending hopper with a capacity of 2,000 tons.

After heating the retorts the waste gases are utilised to heat three Babcock and Wilcox waste heat boilers, each capable of generating 10,000 lb. of superheated steam per hour. It may be recalled that the Birmingham Gas Department ranks next to London as the largest gas undertaking in the Kingdom and is the biggest municipal undertaking of its kind in the world. The use of gas in Birmingham continues to show a steady increase and during the past twelve months the daily and weekly records have been broken on several occasions, whilst the consumption during the twelve months ended March last reached the record yearly total of approximately 14,250,000,000 cubic feet.

Oil and Colour Chemists

Problems Before the Paint and Varnish Industry

THE annual dinner of the Oil and Colour Chemists Association was held at the Hotel Cecil, London, on Wednesday, April 18, Mr. C. A. Klein (President) in the chair. Among the guests were Lord Askwith, Sir Robert Robertson (Government chemist), Mr. J. Russell Thornbery (President of the National Federation of Associated Paint, Colour and Varnish Manufacturers), Mr. F. H. Carr (President of the Society of Chemical Industry), Sir Alexander Gibb (President of the Institution of Chemical Engineers), Sir Gerald Bellhouse (H.M. Chief Inspector of Factories), Sir Richard J. Allinson (H.M. Office of Works), Mr. E. R. Bolton (Vice-President of the Institute of Chemistry), Sir William T. Furse (Director of the Imperial Institute), Mr. Godfrey Giles (President of the Incorporated Institute of British Decorators), Professor G. T. Morgan (Superintendent of the Chemical Research Laboratory, Teddington), Mr. S. K. Thornley (President of the Research Association of British Paint, Colour and Varnish Manufacturers), Mr. H. T. Tizard (Department of Scientific and Industrial Research), Professor H. E. Armstrong, and Mr. T. Wilson (Deputy Keeper of Westminster Hall).

Ten Years of Progress

Lord ASKWITH proposing "The Oil and Colour Chemists Association," said that in the ten years of its existence the Association had made considerable progress. The membership now amounted to 360 and extended into America and the Dominions. The Association, which had absorbed the Paint and Varnish Society, came into being because during the war it was found that gelatine was wanted and there was left a waste product in the form of a nasty substance of a fatty character, and the problem was how to make use of it. Since then, the Association had gone on to deal with the commercial, scientific, and artistic sides, and it had given great assistance in many ways to Government Departments. Then there had also been started the scheme of research at Teddington, which not only had done excellent work so far, but promised very much better work in the future. Clearly, therefore, the work of the Association was proceeding along lines which not only promised great success in the future, but opened up ever-widening fields of development. It was due to the work of the oil and colour chemists that it had been found possible, in recent years, to tell from the pigments used whether a particular picture had actually been painted by a great artist or by one of his pupils, and that was an interesting application of the work of the oil and colour chemist as regards colour. In another direction, also, there was room for an enormous development, and that was in regard to the prevention of corrosion. It had been estimated that no less a sum than £6,000,000,000 were lost annually by rust, and if by means of covering materials that loss could be minimised, it would indeed be a valuable work. The oil and colour industry, however, had to face considerable competition. Synthetic chemistry and the manufacture of artificial products was developing exceedingly rapidly, and all this pointed to the need for common effort of a co-operative nature, such as was being carried on by the Association.

The Growth of Co-operation

The PRESIDENT in responding, said that the past year had been one of steady progress in the Association, and he hoped there would be many such years in the future. When the Oil and Colour Chemists Association was formed there was a great deal of shaking of heads and there was some doubt expressed as to whether an unnecessary association was not being formed and whether those who were responsible for it were not indulging in the common mistake which was being made, viz., the multiplicity of societies. There was a mild outcry, and it was suggested that what was needed was that the existing societies should be unified, after the example of America. As a matter of fact he had just returned from America, and the one thing he did not find there was unification of scientific societies. There was multiplicity of societies, but not unification. On the other hand, those who were responsible for the formation of the Association felt there was a lot of truth in the old saying that the best things the English people had ever done had been accomplished by lonely workers and small organisations, but although the Association had gone to work on those lines and preserved its independence, it had, at the same time, developed the spirit of co-operation.

As regards the future, he did not think the institution of the Association would lead to inaction. The work so far done was ample in quality, and what had to be looked for was an increase in quantity. If quality was their watchword, then quantity would come as the Association expanded. At the same time, they could never hope to become a large organisation because the industry itself was not big enough for that, but there was still a long way to go. There were still many men in the industry who did not belong to the Association, and the time should come when they would all be roped in.

Competition from Synthetic Products

Lord Askwith had referred to synthetic chemistry and the fact that during the last ten years synthetic chemistry had advanced by leaps and bounds. As a matter of fact, it was being realised more than ever to-day that the paint and varnish industry was a branch of industrial chemistry, and the sooner those in the industry fully realised that the better. For many years they had depended upon natural products, but those who were responsible for the production of natural products must read the writing on the wall fairly quickly if they were to maintain natural products as the main materials in the industry. Synthetic chemistry was developing so rapidly that the number of products already being made was bewildering. It was to be hoped that the story of synthetic indigo would not be repeated. The threat of synthetic indigo was never taken seriously until it was too late, and that must not be repeated in other directions. At the same time, we must not disregard the properties peculiar to natural products; indeed, the two must go hand in hand to a very large extent.

As regards the position of the chemist in the industry, frankly he thought it was very much better than it had been in the past. The ill-feeling that existed between the practical man and the chemist was being rounded off and they were seeing more eye to eye. That was a position which must be fostered and strengthened, so that progress would not be hindered owing to the lack of ability of the two to see things from the point of view of the other.

The Work of the Colour Chemist

As to the work of the colour chemist in general, there was no doubt that the old school of painters viewed the chemist with a good deal of distrust. They blamed the chemist for everything that went wrong; it was alleged that the body had been taken out of the paint or that chemicals had been put in which resulted in trouble. These men clung to their old ideas with extraordinary tenacity, and the amused tolerance with which some of them treated the chemist was very delightful if the chemist had a sense of humour. However, the Association as a body had endeavoured to work with the painters in every possible way, and some very useful joint discussions had been held with the Incorporated Institute of British Decorators. After all, it must be remembered that the painter was the man who had to use the materials and to carry out the final tests upon which the behaviour of the products depended. For this reason it would be exceedingly useful to be able to arrive at some method of standardisation of tests in the industry.

Dr. H. HOULSTON MORGAN who proposed "The Guests" recalled that when the Association was first started there was a rule which prohibited chemists in the employ of the Government from being elected members of the Society. After twelve months, however, that rule was rescinded at the instance of himself and he believed it would be agreed that a wise course had then been adopted.

Sir ROBERT ROBERTSON (who expressed satisfaction that one of his esteemed colleagues, Dr. J. J. Fox, was the President-Elect of the Association) and Mr. J. RUSSELL THORNBERY replied.

Mr. J. H. Aiken, general secretary of the Oil and Colour Chemists Association, writes: "In connection with the report in your journal concerning the tenth annual dinner of this Association, I note that this appears directly after the account of the visit paid to the laboratories of the Research Association. I would like to point out that this Association has no connection with the Research Association, the two being separate bodies. I shall be obliged if you will make the necessary correction in the next issue."

Chemical Engineering Group Meeting

Interesting Visits to Laboratories

A JOINT meeting of the Birmingham and Midland Section of the Society of Chemical Industry and the Chemical Engineering Group was held at the Engineers' Club, Waterloo Street, Birmingham, on Friday, April 20. There was a representative attendance of members of the Society, and members were present from London, Sheffield and various Midland centres.

An Industrial Research Laboratory

A company of about 50, including a number of distinguished technologists, paid a visit of inspection to the heat treatment shops at Windsor Street Gas Works, and to the physical and mechanical testing laboratories, chemical department and furnace rooms of the industrial research laboratories of the Birmingham Gas Department. This branch of the department's activities was inaugurated sixteen years ago, the object then being to ascertain the possibility of town's gas as an industrial fuel. It was demonstrated that it could be employed in a great variety of processes, and, further, that increased efficiency could be obtained by the adoption of scientific design of apparatus. The installation of metallurgical laboratories followed quickly on the establishment of foundries and heat-treating shops, and a large amount of valuable pioneering work was done in the development of industrial heating plant. Since 1918 there has been a greatly accelerated demand for technical assistance on the part of manufacturers, and a few years ago the laboratories were enlarged.

In the physical and mechanical testing department, there is installed a 100-ton tensile testing machine—one of the largest in the provinces. The furnace section is noteworthy for its large variety of heat treatment furnaces, which are used by large numbers of manufacturers in Birmingham and the Midlands for such operations as carburising, hardening, annealing and tempering in the engineering, motor-car, and cycle industries, and for annealing operations in the non-ferrous industries. The laboratories have done much to bring into use large numbers of recuperative and regenerative furnaces, but the department being a scientific body does not, it is urged, push the claims of gas if industrial work can be done better by oil, electric, or steam power.

The party were greatly interested in the various types of plant used in the heat treatment shops in connection with the hardening and tempering of steel and its general treatment, and in the most modern types of gas-heated furnaces.

New Type of Gas Sealed Furnace

A new type of gas sealed furnace (muffle type) employed for the hardening of fine tools and for moulding dies, claimed special attention. This furnace is a modification of a gas sealed furnace which was introduced some years ago by Dr. C. M. Walter (engineer in charge of the research laboratories). The work required to be done was formerly suspended in a vertical tubular muffle, but the modified form consists of a gas sealed horizontal muffle. The work is introduced on a tray through the front of the muffle, and on being raised to the required temperature the charging tray is pulled forward, and by a rotational action the work is discharged through the gas sealed tube into a quenching tank containing either oil or water. This arrangement offers many improvements over the original model in that it enables the work to be done in the same way as with an ordinary furnace. Various types of temperature measuring and controlling apparatus, including a recording potentiometer which is employed for temperature recording in connection with the heat treatment furnaces, were also shown.

At the research laboratories at the Council House, tests on various materials were carried out, and demonstrations were given of different types of mechanical and physical testing machines. In the metallographical section, experiments were made by members of the party with the projecting microscopes and apparatus used in connection with the photographic reproduction of metal structures. Other sections visited included a small electrical testing laboratory where methods for obtaining critical points and the cooling curves of metals were demonstrated. Types of standardising apparatus were shown, in particular, a method for determining the relative thermal insulating properties of materials.

Chemical and Metallurgical Laboratories

At the chemical and metallurgical laboratories, demonstrations were given with various apparatus for the testing of quenching oils and also the chemical composition of steels. The methods of determining the carbon content of steels by new forms of apparatus were demonstrated; and a high-temperature combustion furnace for the rapid combustion of steel in oxygen proved of special interest.

The party dined at the Engineers' Club, Mr. W. A. S. Calder (chairman of the Birmingham and Midland Section) presiding, and on the motion of Mr. H. W. Rowell, thanks were accorded to the Birmingham Gas Committee, the general manager of the Gas Department (Mr. A. W. Smith), and Dr. Walter and his staff for the facilities afforded to the visitors. Mr. V. E. Green (assistant chief engineer at the research laboratories) and Mr. H. R. Hems (industrial heating section) co-operated with Dr. Walter in conducting the party through the laboratories and heat treatment shops.

Dr. Walter's Paper

A paper was then read by Dr. C. M. Walter on the "Heat Treatment of Ferrous Metals." Dr. Walter dealt with the application of heat to steels of different kinds in their final state, and more particularly in regard to the manner in which heat treatment affects the mechanical and physical properties of the material, which point is of importance to the engineer, especially in connection with the design of automobile and aircraft components. Among the matters discussed were critical points, effect of varying carbon content, annealing, carburising, etc. The question of fuels suitable for heat treatment was dealt with in some detail.

In the discussion which followed, Professor J. W. Hinchley (secretary of the Institution of Chemical Engineers), Mr. S. J. Tungay, Mr. H. Talbot (chairman of the Chemical Engineering Group), Mr. A. J. Broughall (Midland representative of the Chemical Engineering Group), Mr. W. A. Benton, Mr. H. W. Rowell and others took part.

Iodine now Manufactured by Tarapaca and Tocopilla Nitrate Co.

THE twenty-first annual meeting of the Tarapaca and Tocopilla Nitrate Co., Ltd., was held in London on Thursday, April 19. Mr. Edward Eyre, the chairman, who presided, said that the manufacture of iodine was commenced in January and the quota already granted by the Association would now be increased on account of their increased output of nitrate. With regard to the nitrate production, the new oficina San Andres had been working satisfactorily since it was opened in February, 1927. During the year it was decided that in order to obtain a more satisfactory yield from the material treated, the four extra boiling tanks provided for in the original plans should be added. This installation was completed by March 1 last, and the output for that month was 63,000 metric quintals, an increase of nearly 25 per cent. over the average of the previous monthly productions, a result which certainly justified the extra expenditure.

First Meeting of Lead Tetraethyl Committee

SIR FREDERICK WILLIS presided at the first meeting of the Government committee on lead tetraethyl (ethyl petrol), at the Ministry of Health on Friday, April 20. The committee, which includes representatives of the Ministry of Health, the Home Office, the Air Ministry, and the War Office, met in private and arranged the procedure of future meetings. An announcement afterwards issued by the Ministry stated that the next meeting of the committee would be held in Room 61, Second Floor, H.M. Office of Works, St. James's Park, S.W.1, at 11 a.m. on Monday, April 30, when evidence will be taken from the Air Ministry and the Anglo-American Oil Co. The proceedings at that meeting will be open to the public. The duty of the committee is to ascertain whether the use of ethyl petrol is in any way dangerous to health, and any persons wishing to give evidence on this question should communicate with the secretary of the committee, Ministry of Health, Whitehall, London, S.W.1.

The Inhibition of Knocking in Motors

History and Development of Anti-Detonants for Motor Fuels

At a meeting of the Institute of Fuel held at Burlington House, London, on Wednesday, April 18, Mr. H. S. Tegner read a paper on "The History and Development of Anti-Detonating Agents for Motor Fuel"

Mr. Tegner pointed out that the term detonation was apt to be rather confusing, because knocking might be either mechanical or the result of using unsuitable fuel. In 1915 the General Motors Research Laboratories, U.S.A., under Mr. C. F. Kettering, discovered that the Delco House lighting engine, which was being manufactured by that firm, was difficult to instal in a great many homes because of the regulations laid down by the various State authorities as to the storage of petrol in houses, and, on the other hand, General Motors, by using kerosene in these engines, got very serious trouble from "knocking." Thomas Midgley, Jnr., and T. A. Boyd, of the Research Department of the firm, therefore undertook the investigation of the difficulty in the Research Laboratories at Dayton, Ohio.

Action of Benzol and Toluol

Midgley and Boyd knew from previous research work that the addition of such substances as benzol and toluol to petrol suppressed detonation. They then started on other substances and actually tried, during the course of this investigation, some 33,000 different chemicals. Iodine was one of the first substances tried which proved successful. It was then that Midgley got the idea that the colour of the substance used had some influence on the "knock," and he consequently experimented with some of the aniline dyes. These also proved successful up to a point. Whilst, however, both iodine compounds and aniline derivatives could be quite accurately termed anti-detonators, from a practical point of view they had serious drawbacks. Iodine compounds were extremely costly, and aniline and its derivatives had certain gumming tendencies, so that engines using a mixture of aniline with petrol had to be frequently dismantled and cleaned.

After further exhaustive work on many varied chemicals the investigators put forward the following chemicals in their effective order of anti-detonating efficiency :—

	Relative Effectiveness (Volume).
Benzene	1·0
Toluene	1·093
Xylene	1·20
Alcohol	1·85
Aniline	11·45
Ethyl Iodide	13·87
Xylidine	12·03
Tolidine	11·86
Tin Tetraethyl	20·4
Diethyl Selenide	62·5
,, Telluride	250·0
Iron Carbonyl	250·0
Nickel ,,	277·0
Lead Tetraethyl	528·0

Lead Tetraethyl

It would be observed that lead tetraethyl was by far the most effective in anti-knock value. The chief difficulty met with during Midgley's preliminary experiments was the burning of the tetraethyl lead in the engine to litharge, some of which accumulated on the plugs and valves and caused the plugs to short very quickly and the valves to stick. Finally, it was discovered that it was possible to overcome this trouble by the addition of a halogen bearer which had the effect of combining with the litharge during combustion and forming a volatile compound which was ejected through the exhaust ports.

The halogen bearer now being used was ethylene dibromide, and this had proved in every way successful, the resulting deposit in the engine being even less injurious than ordinary carbon ; in fact, it is claimed that the traces of lead bromide in and on the cylinder walls had a beneficial effect in that they increased the smoothness of the sliding surface by filling up the microscopic voids in the cast iron and acted in very much the same way as a graphite lubricant.

The Voyage of the "Ethyl."

A most interesting development took place during the search for a suitable substance to overcome the lead deposit. The chemists at the du Pont factory at Wilmington, Delaware, were asked to look for possible sources of bromine. They decided to extract the bromine from the bromides of sea water, and a vessel, the s.s. *Lake Harminia*, was purchased from the Government and fitted up as a floating laboratory with a bromine extraction plant installed. The ship was rechristened the *Ethyl* and sent out to sea. It returned in ten days' time, after a very rough passage, the five chemists on board having all suffered severely from sea-sickness, and the total haul consisting of five sharks and seven barrels of tribromaniline. At the present moment supplies of ethylene dibromide have improved, and this is adopted for use with tetraethyl lead in petrol.

When, during the search at the Badische Anilin und Soda Fabrik, Ludwigshafen, for an anti-knocking medium, the adaptability of iron carbonyl for this purpose was under observation, extensive tests were also made to discover a technical process for the production of this liquid. Favoured by the comprehensive and varied experience gained from the Haber-Bosch ammonia process of working with high pressure, it was possible to overcome all difficulties in a very short time, and to produce iron carbonyl in quantities sufficient to refine all the petrol used in Europe and convert it into a "knocking-free" product.

Iron carbonyl mixed in equal proportions with kerosene oil is termed Motyl. Motyl, when added in the proportion of half-a-gallon to a hundred gallons of petrol, or 0·5 per cent., is sold in Germany to-day under the trade name of Motalin, for use in high compression engines. Unfortunately, iron carbonyl as an anti-detonant has several disadvantages which up to date have not been overcome, the major one being that the sparking plugs are affected by an accumulation of iron oxide on the insulators, which results in shorting. Nickel carbonyl is another efficient anti-knock of the metallic compound group. However, here again there are serious disadvantages in its use which have so far not been overcome. One other anti-knock substance is thallium, and a British patent has been granted to the Asiatic Petroleum Co., Ltd., and Mr. A. C. Egerton for this invention, but it presents difficulties.

The Question of Toxicity

After the war, the Standard Oil Co. of New Jersey, realising the merit of lead tetraethyl as an anti-detonant, entered into negotiations with the General Motors Corporation and eventually an agreement was reached in 1924 between them, whereby the Ethyl Gasoline Corporation was formed to handle the marketing of ethyl fluid. The Standard Oil Co., of New Jersey, commenced the manufacture of tetraethyl lead at their Bayway refinery and endeavoured to cheapen the process by adopting the ethyl chloride process. Unfortunately, due to the lack of experience in the manufacture of this chemical and the necessary precautions required in the handling of this lead compound by the personnel, two of the autoclaves burst and caused the death of four employees. Tetraethyl lead poisoning is a special form of lead poisoning.

In conversation with one of Midgley's personal assistants who was with him during the whole of his preliminary investigation, it was discovered that this man had been in the habit of syphoning the liquid by mouth from one container to another and breathing the fumes continuously for eight hours on end.

Following the Bayway accident mentioned, quite a scare spread through the non-technical Press. The chief opponent to the use of even small quantities of this lead in petrol was Professor Yandell Henderson of Yale University, his argument being that in any large city the exhaust fumes of lead-treated motor fuel would prove a serious menace to the community. In order to vindicate themselves the Ethyl Gasolene Corporation suspended the sale of ethyl fluid in May, 1925, pending a thorough examination by the U.S. health authorities. In the meantime, the du Pont Chemical Corporation, at Wilmington, Delaware, had commenced the manufacture of the lead tetraethyl under very strict supervision and with entirely

adequate equipment. Medical examination of the personnel employed was insisted on, and closely adhered to. The plant is of the most up-to-date type, and ventilation is as nearly perfect as possible. At the present moment this product is turned out in considerable quantities with absolutely no risk of trouble, and in 1925 the daily output was 1,000 gallons of lead tetraethyl per day, one gallon being sufficient to treat 1,500 gallons of petrol.

Manufacture of Lead Tetraethyl

The manufacture of the tetraethyl lead is as follows:—Lead and sodium are smelted together to form a lead-sodium alloy which is pigged and crushed to a coarse powder. The powdered alloy is then put into autoclaves with heat control, and gaseous ethyl chloride passed over it, the resultant products being crude lead tetraethyl and sodium chloride. The liquid tetraethyl lead is drained off and steam distilled, the vapour being caught and condensed. The distilled tetraethyl lead is then passed through to storage tanks, and blended with ethylene dibromide and Halowax oil which has a distinctive red aniline dye dissolved in it.

A committee of seven of the leading American scientists and medical authorities was appointed to investigate the health hazards involved in the handling and use of lead-treated motor fuels.

Its final decision was that the sale of ethyl gasolene should recommence and the Ethyl Gasoline Corporation be free to carry on their business.

At one time it was believed that there was a limit to the quantity of fluid which could be added to a gallon of petrol without giving trouble, but later experiments seemed to refute this opinion, it now being possible with careful manipulation of various spirits and various concentrations of this fluid to achieve excellent results in very high compression engines, ratios as high as 9·5 to 10 : 1 having been used successfully. However, those higher concentrations were not advisable or necessary for the average automobile engine. Three cubic centimetres of tetraethyl lead per gallon of motor spirit was considered ample for ordinary purposes. Compression ratios as high as 6·5 to 1 could be used quite satisfactorily on this blend.

It must be clearly pointed out that whereas in the manufacture of the product known as lead tetraethyl there was a definite health hazard, once this fluid was mixed under proper conditions with motor spirit in the recommended proportions the risk then became non-existent. After four years of continuous use and distribution of very large quantities, investigation had failed to show evidence of any injury to any person who had had to do with the handling or the use of the spirit or to repairers of automobiles which had used this fuel exclusively.

In the U.S.A. it was now possible for car manufacturers to increase their compressions, to get more power from the same sized engine, and be assured of a uniform fuel for their customers wherever they might be.

Woollen Research Association: New Chairman

At a meeting of the council of the British Research Association for the Woollen and Worsted Industries, held at Torridon, Headingley, Leeds, on Friday, April 20, Sir James P. Hinchliffe intimated his wish to retire from the chairmanship, which he had held since September, 1918. He proposed as his successor Colonel the Hon. F. Vernon Willey, of Francis Willey and Co., Ltd., Bradford, who had intimated that he would be prepared to take office as chairman of the Association. Colonel Willey is a past president of the Federation of British Industries and president of the Wool Textile Delegation. Messrs. H. S. Clough, F. T. Chadwick, E. T. Walker, and Sir Henry Ballantyne were elected vice-chairmen of the Association.

Talc Deposits to be Developed in Alberta

Development of the deposits of blue and white talc which are found in the vicinity of Banff is planned during the coming season, according to Mr. H. B. Lumsden, assistant director of the Development Branch of the Canadian Pacific Railway. Mr. Lumsden states that a road 20 miles in length will be built between Massive Siding and the deposits to make them readily accessible. The blue variety of talc, which is very rare and valuable, is used in electric insulators and gas-burners.

The Budget

By Sir Ernest Benn

When the Conservative Press says that a Budget is good and *The Daily Herald* on the same day prints big headlines telling the workers that the Chancellor has adopted the Labour view and that there is to be relief for industry, the business man must approach the subject with caution. Mr. Churchill, however, on Tuesday secured a personal triumph, and added to his reputation in political and Parliamentary circles; but that, again, does not necessarily mean that the business man should join in the chorus of approval and delight.

The Business Point of View

It seems to me essential that business men should adopt and maintain a highly critical attitude towards this and every other Budget, for very little constructive or sensible criticism is likely to be forthcoming from any other quarter. On these lines the first general consideration that arises out of the Budget is the inconvenience, if not the folly, of all the changes in form which Mr. Churchill has produced. Figures at the best are difficult to understand, and in general are deceptive and misleading. The only real truth that can ever be secured from a figure is in its relation to another and strictly comparable figure. It does not interest anyone in business to know that a quantity or a price or a total is so much. The vital point is to know whether the figure, when ascertained, is better or worse than the corresponding figure of a previous period. The financial trickster in business is always altering the form of accounts so that no real comparison and no true conclusions can be derived from his statements. A very few years will be all that is necessary for an ignorant public to form the impression that Mr. Churchill reduced the national accounts from some £800,000,000 to the expenditure which he now puts at £676,000,000, and completely false opinions will be founded on that false comparison.

Getting Out of Difficulties

The second criticism of the present Chancellor of the Exchequer is a tribute to his genius for getting out of difficulties. Every good commercial balance sheet contains something in the way of hidden assets: goodwill, buildings and reserve accounts are stock examples. The investment account, where one exists, is even better. No commercial auditor will ever allow an investment to be written up, and no wise business man fails to write down those items that have depreciated. Now Mr. Churchill has, for the third time, scrounged through the national ledgers and robbed the country of the few odd little items of this class that it possesses. Last year it was brewers' credit and Schedule A. This year he has unearthed what he calls a profit of £13,000,000 from the currency note reserve, stolen the balance from last year which belongs to the old sinking fund, and shuffled the debt services so as to provide, in fact, rather less for interest and sinking fund than is likely to be required.

No Appreciation of Economy

The appalling thing about the whole situation is the total absence of any real appreciation of the need for economy. The word itself is used now and again in the Budget speech, but economy as a policy is almost gone from the programme or the thoughts of any political party. Industry will be wise to look the gift horse of relief of rates very carefully in the mouth. It is very nice to contemplate a remission of three-quarters of the direct charge for rates. If, however, this transference of big responsibilities from the localities to Whitehall robs the local authorities of the few remaining vestiges of the spirit of economy which remain among them, and thus leads to heavier tax burdens on the nation, industry may find that while its rates have diminished somewhat, its markets have dwindled somewhat more.

Mr. Churchill rivals Mr. Lloyd George in his ability to create new functions and new work for the bureaucracy and new complications for the rest of us.

Having said so much, it would be ungracious to fail to admit that the Chancellor of the Exchequer has done wonders in the circumstances in which he finds himself, and the peculiar world in which we live, without the backing of a public opinion set on economy. In a world in which this view is practically inarticulate to-day, it is difficult to see how Mr. Churchill could have done better.

Progress of Lever Brothers

Points from Chairman's Speech at Annual Meeting

THE thirty-fourth annual general meeting of the shareholders of Lever Brothers, Ltd., was held on Thursday, April 19, in the Lyceum, Port Sunlight, Cheshire. Mr. F. D'Arcy Cooper (chairman of the company) presided, supported by the Right Hon. the Viscount Leverhulme (governor of the company) and the board of directors. There was a large attendance of shareholders.

The chairman, before dealing with the year's business of the company, said that he would like to introduce their new director, Mr. Horatio Ballantyne, F.I.C. During the year Mr. Ernest Walls resigned his appointment, and they were fortunate in securing the services of Mr. Ballantyne, who for many years had acted as consulting chemist to their business and to many other of the great industries of this country. He occupied a high and honoured position in his profession, and the chairman felt sure that the appointment, which was a whole-time one, would be of great value to the company.

Developments in Buildings, Plant, etc.

The chairman went on to say that during the year there had been expenditure by the parent company and associated companies amounting to £1,338,024. In this country, among other things, £201,645 was spent on the Bromborough Dock, which they anticipated would be completed in 1929; £24,000 on a new electric generating plant at Port Sunlight; £75,000 on account of the erection of the new Irish factory; £82,000 mainly on the completion of a new silicate and caustic plant at Warrington.

Overseas the principal sums spent were: £187,000 in the Belgian Congo on European and native houses, erection of new mills, additions to the Congo fleet, and on clearing and planting; £140,000 in other parts of Africa, including £66,000 in Nigeria (of which £30,000 was spent on additions to the Niger fleet and £19,000 on new buildings), £25,000 on the Gold Coast, mainly on new stores and dwelling houses, and £25,000 in Senegal and the French Sudan on motor transport and new mills; £125,000 on additions to plant and purchase of land for the American factory; £20,000 on new plant for the Brussels factory; £157,000 on account of the new factory at Buenos Aires; £24,000 on development of the estates in the Pacific Islands; £51,000 on completion of a new factory and plant at Alexandria, Sydney, New South Wales; and £23,000 on additions and extensions to the German factory.

It might occur to them to inquire from what source they found the money for this outlay, as the capital of the company had not been increased since 1924. The answer was that it was financed by the profits which the company and its associated companies set aside every year for depreciation. In 1927 the amount provided was not less than £1,300,000, the balance coming from profits carried to reserve. Thus they would see that in addition to maintaining fully both the buildings and plant of the business out of revenue they utilised a portion of the profits earned each year in erecting new buildings and plant, thereby providing for the normal development of business.

The Glycerine Position

Their trade in Great Britain had been satisfactory. Prices of raw materials had been somewhat to the advantage of the soapmaker; on the other hand the price of glycerine—which was one of the most important by-products of the soap manufacturer—had been heavily depressed. At December 31, 1926, the market price for crude glycerine was approximately £75, while at December 31, 1927, it was nearer £40, requiring, therefore, heavy writing down of their glycerine stocks. He was, however, not pessimistic as to the future of this trade; the use of glycerine in large quantities until recently had been confined largely to the manufacturers of explosives, and seldom had any quantity been available for its more general use in other directions. They had been passing through a transition period, where partly owing to the smaller demand by the explosives manufacturers on the one hand, coupled with the many improvements in the method of recovering glycerine and the world increase in soap production on the other, greater quantities had been available than could be readily absorbed. These facts had created an artificial market position, and while they did not anticipate that such conditions would continue to obtain, they had felt it wise to deal drastically with the stock value of this product.

Owing to the increased output of glycerine, new sources of application were being rapidly developed. The one of most interest to the public was its use in motor-car radiators. A 30 per cent. solution of glycerine had the valuable property of a very much lower freezing point than that of water, thus preventing freezing in the radiator. Other materials had been tried as "anti-freeze" preparations, but they possessed the drawback either of causing corrosion or of being volatile. No such objections applied to glycerine. It was likely that this fact would prove very valuable commercially, for the usual insurance policy did not cover the risk of damage to motor engines by frost.

Vitamin Margarine

The improvement in the margarine trade to which he referred last year had not been maintained, and the present prices for the cheaper lines showed no margin of profit; they were, however, concentrating on the sale of their new Vitamin Margarine, and were satisfied that when this great improvement in the edible trade of the country became more widely known the shareholders would reap the reward of many years of patient research. The Pharmaceutical Society had given it the following certificate: "The Pharmaceutical Society of Great Britain has purchased nine samples of Viking Margarine, made by Planters Foods, Ltd., during the past twelve months. These samples were bought by the society's own representatives on the open market. They have been examined for the amounts of vitamins A and D in comparison with samples of the highest priced fresh butter bought at the same time. The society is satisfied that the Viking Margarine at present sold to the public contains at least as much of these factors as does the fresh butter."

In giving the certificate, the society asked them to make the following announcement: "In view of the numerous claims made that different food preparations contain vitamins, the need has been apparent for some independent body to be willing to investigate such claims and, where the preparation is of sufficient importance, to certify these if found good. In 1926 the Pharmaceutical Society of Great Britain established a department for this purpose, in which the present testing has been done. The fees paid for the testing represent no profit to the society."

Whale Oil

Turning to their interests abroad, he would take first the most distant one—whaling. During the night of February 25 last, their floating factory, the *Southern Queen*, was struck in the engine room by drifting ice and became a total loss. The crew took to the lifeboats after S.O.S. had been sent out to the catching vessels, and within an hour three whale-catchers appeared on the scene and took the shipwrecked crew aboard. Fortunately there were no casualties, but the *Southern Queen* took with her over 3,000 tons of whale oil. She was, of course, insured, and no time had been lost in replacing her, for they recently acquired from the Eagle Oil Transport Co. the *San Jeronimo*, a ship of 15,500 tons which, when necessary alterations had been made, would cost about £155,000. They had also placed orders for two new whale-catchers to be built in this country.

Upon their various schemes of prosperity sharing, they had spent during the past year for the benefit of the Port Sunlight employees the equivalent of a dividend of 4.47 per cent. on the issued ordinary shares of the company, and this percentage would be considerably increased if the contributions of associated companies were added. This expenditure was outside anything for co-partnership, and was, of course, subject always to the condition that the business could continue to afford to pay for it.

The chairman moved, and Lord Leverhulme seconded, the adoption of the report and accounts (given in THE CHEMICAL AGE of April 7, p. 332). The resolution was carried, as were also further resolutions that Lord Leverhulme be reappointed a director, and that a sum not exceeding £5,000 be placed at the disposal of the directors for their services during the year 1927, to be divided as they thought fit.

British Chemical Manufacturers

The New General Manager

MR. J. DAVIDSON PRATT, M.A., B.Sc., F.I.C., Chief Superintendent of the Chemical Warfare Research Department, has been appointed general manager of the Association of British Chemical Manufacturers, in succession to Mr. W. J. U. Woolcock, who has resigned to take up another appointment.

Mr. Davidson Pratt, who was born in 1891, hails from Deeside. After early education at Drumoak Higher Grade School and Robert Gordon's College, Aberdeen, he entered Aberdeen University in the autumn of 1908, from which he graduated as M.A. in March, 1912, with first class honours in mathematics and natural philosophy, and with the Simpson Prize in mathematics. In March, 1913, he graduated as B.Sc. with special distinction in mathematics, natural philosophy, and chemistry. After several months as a Carnegie Research Scholar, he was appointed assistant to the Professor of Chemistry at Aberdeen, which post he held until he was mobilised in August, 1914.

He served overseas as a subaltern with the 4th Battalion Gordon Highlanders T.A. for several months in 1915, during which period he was wounded three times; on the last

MR. J. DAVIDSON PRATT.

occasion seriously. After about a year in hospital, he was declared unfit for further foreign service and was seconded, in August, 1916, to the Ministry of Munitions as Assistant Secretary to the Chemical Advisory Committee, which afterwards became the Chemical Warfare Committee. He became Secretary of the Committee in December, 1918 and was retained to assist in the winding up of the old Chemical Warfare Department of the Ministry of Munitions and in the formation of the peace research organisation for chemical warfare, and, while so doing, was given the appointment of a staff captain.

With the resuscitation of the Chemical Warfare organisation he became Secretary of the new Chemical Warfare Committee in 1920. In July, 1923 he was appointed Controller of Chemical Warfare Research and, at a slightly later date, when the various branches of the research organisation, consisting of a headquarters in London, an experimental station at Porton, near Salisbury, and a research establishment in Lancashire, were amalgamated to form the Chemical Warfare Research Department, he was appointed the chief superintendent. In this capacity he was responsible for the administration, general direction, and control of all chemical warfare research and experiment required by the three fighting services.

Mr. Davidson Pratt was awarded an O.B.E. for his war services in 1919. He is a Fellow of the Chemical Society and a member of the Society of Chemical Industry, the American Chemical Society, the Faraday Society, and the Institution of Rubber Industry. He was elected a Fellow of the Institute of Chemistry in 1927. He married in June, 1918, Kathleen Winifred Jean Marsden, a daughter of Mr. William Summers, shipbuilder, Southampton.

British Glues and Chemicals

Suggested Reorganisation of Capital

A SCHEME for the reorganisation of the capital of British Glues and Chemicals, Ltd., to which question, as stated at recent annual meetings, the directors have given their close consideration, has been submitted to the shareholders in a circular dated April 20.

After careful consideration the directors are satisfied that in order to make the balance-sheet show the true position it is necessary to reduce the nominal value of the 875,000 issued £1 ordinary shares to 4s. per share—a total writing off of £700,000—which will be applied as follows:—£384,432 in writing down the book value of the land, water rights, railway sidings, buildings, machinery, plant, fixtures and fittings (less the depreciation reserve); £312,624 in writing down goodwill; leaving £2,944 for costs, expenses, etc.

Goodwill will then stand at £80,000, which is considered a fair value, having regard to the sound basis upon which the company is now established. The adoption of these proposals will obviate the necessity, which would otherwise exist, of applying a very considerable part, if not the whole, of the profits of the company, for many years to come, in writing down, by way of depreciation or otherwise, the excessive values at which the capital assets at present stand in the balance-sheet. It is proposed to make up accounts to April 30 in this and future years; and the directors believe that if the company is relieved from the above-mentioned necessity, earnings will prove amply sufficient to justify them in paying the fixed dividend on the preference shares by regular half-yearly instalments commencing with payment on July 31 next of a dividend in respect of the half-year ending April 30.

The concurrence of the ordinary shareholders is necessary for carrying through the proposed reduction of capital; and their concurrence in the drastic writing down of their capital can hardly be expected if the profits thereby rendered available for distribution are to go exclusively to the preference shareholders until the arrears of dividend accrued thereon since April, 1922, have been paid in full. It has, therefore, been made part of the proposals for reduction of capital that preference shareholders shall forgo (excepting in the event of liquidation) payment of their arrears of preference dividend accrued to October last, but in place thereof they are to receive the right to participate in surplus profits in each year (after payment of a non-cumulative dividend to the ordinary shareholders of 5 per cent. per annum on the written down value of their shares) up to an additional non-cumulative 2 per cent. per annum (i.e., a maximum of 10 per cent. per annum) on their preference shareholdings.

Future Allocations of Profits

For the future, therefore, profits distributed in respect of each year will be applicable: (1) To payment of the 8 per cent. cumulative dividend on the preference shares; (2) to payment of a 5 per cent. non-cumulative dividend for the year on the reduced ordinary shares; (3) to payment of further non-cumulative dividends for the year on the preference and ordinary shares in the proportion of a further ½ per cent. on the preference shares (up to a maximum of 2 per cent., making 10 per cent. per annum in all) to 2½ per cent. on the ordinary shares. Lastly, in payment of further dividends on the ordinary shares. The preference shareholders are, however, in the event of liquidation, to rank in priority to the ordinary shareholders for an amount equal to the arrears of dividend cancelled under these proposals, less whatever in the meantime they may have received under the participation rights indicated above. In order to conserve the benefit of the capital duty already paid on the capital proposed to be written off the issued ordinary shares, it is proposed to re-increase the share capital of the company by £700,000 by the creation of 700,000 ordinary shares of £1 each, thus restoring the nominal share capital to its existing amount, viz., £2,000,000.

Chemical and Metallurgical Corporation

Progress of Constructional Work

THE eighth ordinary general meeting of the Chemical and Metallurgical Corporation, Ltd., was held on Monday at River Plate House, Finsbury Circus, London. Sir Frederick Mills, Bt., M.Inst.C.E., M.I.Mech.E. (chairman and joint managing director), presided.

Since the last annual meeting, he said, construction work had proceeded rapidly at Runcorn, and some 500 men were at present employed at the company's works. The first unit of plant, that constructed for the manufacture of hydrochloric acid, had been brought into operation on January 1 of this year. This plant, which embodied the latest general improvement in the manufacture of hydrochloric acid and certain particular improvements worked out by the company's technical staff, had operated continuously night and day without interruption. The necessary operating staff was being trained, so that, by the time the ore treatment plant had been finished, a continuous supply of the chief reagent would be assured, and at a cost far below its purchase price in the open market. Practically the entire cost of their ore treatment processes depended upon the cost to them of hydrochloric acid, and shareholders would therefore realise the importance the board attached to its production on the most economic lines possible. During the last few months, whilst training their operating staff and tuning up the plant, they had disposed locally of the whole of the acid produced.

Sulphuric Acid

In order to produce hydrochloric acid, large quantities of sulphuric acid were required, and this had for the past two months perforce been purchased by them. The company had, however, decided to erect its own sulphuric acid plant, and their first plant for its production was about to commence operations, being probably the most up-to-date plant in existence. As regarded the ore treatment plant, the roasting furnaces had been completed, and were now under fire. Their technical staff had continued to work on the treatment of the South African platinum copper and nickel concentration, and a small pilot plant had been put into operation at their Stratford works. This had worked very satisfactorily, and they had been able to obtain high recoveries of the precious metals, together with the copper and nickel in the ore, at a cost which when working on a reasonable scale, they believed could not be approached by any other process.

It might not be generally known that, so far as the directors were aware, there did not exist to-day any non-ferrous metallurgical treatment plant where an ore, concentrate, or other mineral product carrying values in several different metals, could be treated so as to turn out the whole of the constituents of the material in the form of the metals themselves or their finished products. The company had, however, developed processes whereby it could take ores carrying values in sulphur and different metals and successfully extract the different values, and their object was to build up at Runcorn a works where they could eventually not only separate the different values in ores, concentrates, etc., but also turn them out either as metals or their marketable products. In the different departments they would recover sulphur and produce lead and lead compounds; they were making provision for plants for the production of zinc and zinc compounds, and on a small scale capable of extension for copper, nickel, and platinum.

The accounts for the current year would show the beginnings of the profit and loss account, but it was as well to remark that even by the end of the current year they would by no means have got into their stride. During the course of the present year the various departments as they were contemplated last year would have been brought, one by one, into operation. The more one became acquainted with the possibilities of the undertaking, the more one was fascinated by the prospects.

The report was unanimously adopted.

I.G. Profit of £5,000,000

A NET profit of £5,000,000 in the past year, an increase of £1,600,000 on 1926, is shown by the balance sheet which was submitted to the directors of the I. G. on Wednesday. A dividend of 12 per cent. will be proposed at the shareholders meeting next month, against 10 per cent. last year. As was the case last year, £3,700,000 is written off.

Dyers and Colourists' Meeting

Increasing the Affinity of Fabrics for Dyestuffs

A MEETING of the Manchester Section of the Society of Dyers and Colourists was held on Friday, April 20, Mr. J. R. Hannay presiding.

A paper entitled "A New Reagent for the Detection of Oxycellulose," was read by Mr. W. F. A. Ermen, who stated that the commonly used reagents for oxycellulose—methylene blue, alkaline solutions of silver thiosulphate, flavanthrene and caustic soda followed by steaming—did not give strongly marked results. He gave details of the use of a new reagent depending upon the reducing action of oxycellulose, ferric ferrocyanide (Prussian Blue) being formed on cotton containing oxycellulose by a short immersion in a hot solution containing ferric sulphate and ammonium sulphate and potassium ferricyanide. Other applications of the reduction of ferric ferricyanide suggested themselves, e.g., in the titration of hydrosulphite solutions; the dyeing in the cold of tannin-antimony mordanted cotton, potassium ferric ferricyanide being readily reduced by tannic acid; the dyeing of wool; the dyeing and mordanting of fur; the topping of sulphur blacks; and for distinguishing between paper made from cotton or linen and paper made from wood pulp.

A second paper, entitled "Observations on a Novel Method of Increasing the Affinity of Cotton and other Fibres for Colouring Matters," was read by Mr. G. E. Holden, of J. and J. M. Warrall, Ltd. Mr. Holden said that in a previous communication to the Society entitled "Rendering Gelatin Insoluble," it was remarked that most investigators who had devoted attention to the properties of gelatin, including Hofmeister, had failed to observe that gelatin became converted under the influence of heat to an insoluble state, not wholly, as they had surmised, but only in part. It was shown in the communication that only 17 to 18 per cent. of the gelatin became modified to the insoluble state, the remainder being quite soluble in water. The observation of this previously unexpected property of gelatin by the author of the paper had led to the introduction of many interesting and important applications of gelatin in producing somewhat novel coloured effects in the dyeing and printing of cotton materials. Cotton fabric, appropriately impregnated with a solution of gelatin and afterwards subjected to the influence of heat, preferably by steaming under pressure for about one hour, was observed to exhibit remarkably changed properties in regard to the degree of affinity evidenced for certain colouring matters. The special properties of the gelatin modified by the simple operation of steaming under pressure, in relation to the taking up of colouring matters, was investigated comprehensively in association with cotton, wool, silk, acetyl cellulose and other artificial silks, employing, for the purpose, the whole range of generally available dyestuffs. Generally speaking, it was found that the treatment with gelatin greatly increased the degree of affinity of the material for the colouring matter. The increase in this respect was quite notable in the case of wool, silk, and the artificial silks, but was much more pronounced in the case of gelatin-prepared cotton material, and it was the application of the process to this fibre which would doubtless prove of most outstanding interest.

New Type of Thermometer for Accurate Measurement

A COPPER resistance thermometer, designed as part of a new calorimeter for determining heats of formation of metal oxides and sulphides, has been constructed at the Pacific Experiment Station of the United States Bureau of Mines, Department of Commerce, located at Berkeley, California. It had been planned to calibrate it at the melting point of ice and at the transition temperature of sodium sulphate 30° C. higher. It has always been assumed that a linear relationship exists between the resistance of a copper wire and temperature in this short temperature interval. The sensitivity of the apparatus permits of division of the 30 degrees into nearly 90,000 parts, and under these conditions it has been found that the resistance of copper departs considerably from the linear relationship. This means that the Pacific Experiment Station must establish several thermometric points intermediate between the other two; when this is done the new calorimeter should be one of the most accurate and sensitive available.

Second International Coal Conference

Preliminary List of Visitors

PRESIDENT THOMAS S. BAKER, of the Carnegie Institute of Technology, Pittsburgh, who has spent two months in Europe in the organisation of the Second International Conference on Bituminous Coal which will be held at the Carnegie Institute of Technology in November, 1928, sailed for New York on the s.s. *Ile de France* on April 16. Before sailing he stated that he was greatly encouraged at the interest that had been shown in the European countries that he visited in the Carnegie Congress. The programme would not be completed for at least two months, but he had already received tentative acceptances of his invitation to present papers from the following :

From England : Sir Alfred Mond, Dr. Lander, Dr. Lessing, Dr. E. W. Smith, and Messrs. Sinnatt, Humphrey, and E. C. Evans.—From France : Mr. D. Agache, president of the Kuhlmann Co., will be present, and papers will be submitted by Mr. Berr, Professor Mailhe, and Mr. Bing. There will be a representative from the French Department of Mines, and Messrs. Winckler, Weiss, Cling, Simon, Lebeau and Laffont will also be present.—From Germany : Messrs. Krauch, Franz Fischer, Pott, Rosin, Torres, Bergius, Bettig, Pawlikowski, Fritz Hofmann, and Munziger.—From Austria : Professor Fleissner. There will also be representatives from Spain, Belgium, Holland, Russia, Czecho-Slovakia, Italy, and the Scandinavian countries.

The above list is by no means complete, and will be greatly enlarged in the course of the next three months. There will also be papers by representatives of companies that are making use of special processes for the treatment of coal, notably low-temperature distillation processes. The Second International Conference on Bituminous Coal is open to scientists and industrialists of all countries. Fuel technologists who wish to submit papers should communicate with President Thomas S. Baker, Carnegie Institute of Technology, Pittsburgh.

Shipment of Phosphates

Case Heard by Anglo-German Tribunal

IN Division "B" of the Anglo-German Mixed Arbitral Tribunal, on Thursday, April 19, the court comprising Mr. Sandstrom, president ; Mr. Gleeson Robinson, British member ; and Dr. Zacharias, German member, Sir R. Ropner and Co., Ltd., shipowners, of Middlesbrough, claimed from the Deutsche Sudsee Phosphat Aktiengesellschaft the sum of £1,242 in respect of the terms of a Charter Party. Mr. A. Hildesley was counsel for claimants, and Mr. H. Hugh Willink, with Dr. Albrecht, was for the respondents.

A Charter Party

Mr. Hildesley explained that the claim was made under an agreement dated June 3, 1914. Claimants and respondents were parties to a Charter Party dated June 6, 1913. This contained the usual clauses and conditions, and under it Ropner and Co.'s steamers were to have carried phosphates for the respondents to various places in Europe during 1913, 1914 and 1915. There were to have been two cargoes in 1913, four in 1914, and four in 1915, the German company to call the steamers when they wanted them. In the first year, therefore, two steamers were called for and supplied. In the second year (1914) three steamers were loaded prior to June, 1914. That left an obligation on the part of the German company to call for another steamer before the end of the year, and a corresponding obligation on the part of the claimants to comply with the respondents' requirements. But in June, 1914, the German company were minded not to ship a fourth cargo in that year. They approached claimants on the subject, and it was agreed to postpone the taking of the fourth cargo until 1915, the respondents agreeing to pay for the variation 3s. 6d. per ton on 7,100 tons, the amount now claimed. Afterwards the war broke out and put an end to the relations.

Mr. Willink agreed in the main with the explanation of his friend. The question to be considered, however, was what was the legal effect of the fresh arrangement, and he argued that really there was only one contract throughout, namely, the Charter Party. This, under the terms of the Treaty of Versailles, was dissolved by the outbreak of war.

The Tribunal decided to reserve judgment.

A Bookman's Column

DR. Paul Karrer, professor of chemistry in the University of Zürich, has written a compendious textbook of organic chemistry, *Lehrbuch der organischen Chemie*, published (in German) by Georg Thieme, of Leipzig (pp. 884, 34 marks ; bound, 36 marks). In this volume the author has been able to deal very comprehensively with his subject, keeping the historical development in view wherever possible. The configuration of compounds and their stereochemical behaviour is discussed very carefully, and compounds of biological origin also receive thorough discussion. Apart from the chapters dealing with the subjects usually discussed in works on organic chemistry (aliphatic, aromatic, hydroaromatic, and heterocyclic compounds), attention may be drawn to the chapters on the carbohydrates (43 pages), on quinones, including quinonoid dyestuffs (58 pages), and on the alkaloids (67 pages). The book closes with a number of tables of great value, dealing with subjects as varied as the world's coal production, the world's sugar production, the classification of odours, poisons used in industry and in war, the toxicity of gases, dissociation constants, indicators, etc.

* * *

Among the more recent additions to the American Chemical Society Monograph Series is *Hydrochloric Acid and Sodium Sulfate*, by N. A. Laury (The Chemical Catalog Co., pp. 127, $4). The object of this monograph is to present the most useful available equipment in convenient form. The discussions of the principles of the processes and apparatus are intended primarily for the needs of the engineer and the manufacturer, while to the chemist and the student they will indicate the direction of possible improvement. The chapter headings are as follows :—The action of sulphuric acid on sodium chloride ; the properties of hydrochloric acid ; sodium sulphate—properties, occurrence, production, and consumption ; principal raw materials and finished products—specifications and analysis—domestic production ; salt cake furnaces ; salt cake by other methods ; hydrochloric acid produced from chlorine and hydrogen, and other methods ; absorption principles and equipment ; economic factors—production costs, handling, and shipping.

* * *

Constable and Co. have issued the second edition, revised and enlarged, of *Standards and Tests for Reagent and C.P. Chemicals*, by B. L. Murray (pp. 560, 25s.). The author's long experience in charge of the control laboratories of Merck and Co. gives him especial authority to write on this subject. This volume gives specifications and tests for a very large number of chemical reagents, defining permissible limits of impurities, etc. The first edition dealt solely with chemicals of the A.R. type. In this edition there are added discussions on chemicals of the C.P. (commercially pure) type, and this addition greatly enhances the value of the publication. In addition to the specifications and tests, the author gives properties, physical constants, precautions to be observed in storage, etc. To all those who deal with chemical products—manufacturers, analysts, research and control workers and others—this book should be of great practical use for purposes of almost hourly reference.

* * *

The chemical study of perfumes forms a highly interesting field. The firm of Wilhelm Knapp, of Halle, Germany, have just issued *Synthetische und isolierte Riechstoffe und ihre Herstellung* (Synthetic and Isolated Perfumes and Their Preparation) in its second revised and enlarged edition. (pp. 257, paper-covered 14.50 marks, bound 16.50 marks). The first edition was written by Dr. R. Knoll, but the present version is due to Alfred Wagner, director of a Hungarian works producing ethereal oils. A feature of the book is the attention devoted to the plant needed for various operations. In the first, or general, section of the book, such matters as chemical properties, synthesis, analysis, etc., are dealt with. In the special section, perfumes are considered in detail under the headings of alcohols, phenols and their ethers, aldehydes, ketones, lactones, oxides, acids, esters, halogen compounds, nitrogen and sulphur-containing perfumes, and so on. Properties of the substances considered are given in detail, with references to the original literature. In an appendix, a list is given of continental firms manufacturing perfumes, together with notes on their most important products.

Reports on Applied Chemistry

Publication of Twelfth Volume

THE Society of Chemical Industry has just issued the twelfth of its annual *Reports of the Progress of Applied Chemistry*, covering the year 1927 (pp. 726; 7s. 6d.). The size of the volume is almost exactly the same as last year, although the number of subjects reported on is one less, the section on explosives being a biennial feature. This publication, and the related one on pure chemistry issued by the Chemical Society, are things on which British chemists may justly pride themselves. They are not concerned with the work of any single nation, but deal impartially with the activities of the whole world. Most of the sections in the present report on applied chemistry are by the same authors as last year, the newcomers being as follows: Mr. A. J. V. Underwood on "General, Plant and Machinery"; Mr. T. C. Finlayson on "Fuel"; Mr. J. E. Davis on "Gas, Carbonisation, Tar and Tar Products"; Mr. G. A. Guess on "Non-Ferrous Metallurgy"; Mr. J. T. Ellingham on "Electro-Chemical and Electro-Metallurgical Industries"; Dr. E. M. Crowther on "Soils and Fertilisers"; Mr. F. R. O'Shaughnessy on "Sanitation, Water Purification, etc." Mr. F. E. Day has joined Mr. H. Lloyd Hind in writing the section on "The Fermentation Industries," and Mr. J. King has joined Mr. F. S. Aumonier in writing that on "Foods."

These reports are so valuable that the annual greeting of congratulation which they receive is apt to become monotonous. To review the various sections in detail is impossible from considerations of space. It may, however, be observed that some of the writers have included accounts of amalgamations and other events of commercial importance in the fields surveyed by them, thereby adding considerably to the value of the sections. "Paints, Pigments, Varnishes and Resins," as before, represents a co-operative effort on the part of various members of the Oil and Colour Chemists' Association. This is a sign of the times; the increasing volume of literature and the increasing degree of specialisation may render similar action necessary, in the not very distant future, in other sections. In the publication of these annual reports the Society of Chemical Industry is performing an important public duty.

Tube-Still Distillation

A Paper Before the Petroleum Technologists

AT a meeting of the Institution of Petroleum Technologists, on Tuesday, April 17, Mr. C. Edmonds read a paper on "Tube-Still Distillation." He stated that the distillation of crude oil constituted the most important refining operation, and the past few years had witnessed very definite developments in the type of equipment installed for the purpose. The shell still, used either as a batch unit or as a continuous battery and fitted with more or less efficient fractionating equipment, was giving placed to the modern tube still and positive type bubble tower yielding products of definite specifications in one operation, thus reducing substantially the amount of re-running and permitting relatively lower manufacturing costs for investment in equipment, direct fuel, process steam and loss of material. Quite naturally, during such development, there had been difficulties to overcome, but the refining industry might be permitted to congratulate itself that progress in its technical methods would bear comparison with other major industries.

The refiner demanded distilling equipment that possessed flexibility to take full advantage of different crude oils and varying market conditions and demand for products, and obviously such flexibility must at times be secured at some loss of commercial efficiency. In general, tube-still distillation could be classified under two main heads: (1) The "once through" or single flash tube still, using either a single or multiple fractionating tower system, and (2) the "step up" system involving the use of two or more tube stills and towers operated in series. In addition there was the circulating type of tube still, but its usefulness for prime distillation was at the moment apparently somewhat limited, although it had a definite field in certain intermediate refinery operations. Tube-still distillation was a distinct advance on the relatively older types of equipment.

Chemical Matters in Parliament

Health in Artificial Silk Factories

In reply to Mr. Kelly (House of Commons, April 18), Sir William Joynson-Hicks stated that Mr. Jackson, Deputy-Chief Inspector of Factories, had gone to Congleton, and would open an inquiry into the effects of artificial silk manufacture on the health of those who were employed in the industry.

Disease Due to Asbestos Dust

Mr. Briant (House of Commons, April 19) asked the Home Secretary if his attention had been called to the dangers to asbestos workers from asbestos dust; if he would take steps to have a periodical examination of the workers; and if inquiry was being made as to the dangers attending this industry?

Sir W. Joynson-Hicks, in his reply, stated that two cases of suspected danger to health had been recently reported to the Factory Department and the matter was being carefully investigated by the Medical Inspectors. Should their inquiries show that any special precautions be required, the necessary steps for the purpose would be taken.

Dead Sea Salts Concession

Col. Howard-Bury (House of Commons, April 23) asked the Secretary of State for the Colonies whether, with regard to the Dead Sea salts concession, he would take steps to bring about a merging of the interests concerned, backed up by a British group. Mr. Amery, in reply, stated that he assumed that the interests of the various applicants for the concession was meant. He was afraid he was not prepared to intervene in the manner suggested. In a further reply he stated that the discussions had not reached a point which would enable him to inform the House of the names of the financial supporters behind Mr. Novomeysky.

Employment in the Chemical Industry

In a written answer to Mr. Kelly (House of Commons, April 23) Mr. Betterton stated that the estimated total number of insured persons engaged in chemical industry in Great Britain was 93,390 in July, 1926; 94,900 in July, 1927. The number of insured persons recorded as unemployed was 7,639 on March 22, 1926, 6,033 on March 21, 1927, and 5,235 on March, 1928. The figure for 1928 was exclusive of persons aged 65 years and over.

Low-Temperature Carbonisation Plant at Richmond

In reply to Mr. Shinwell (House of Commons, April 24) Commodore King stated that the necessary plant for a three years' trial of the scientific treatment of coal on a commercial scale was being erected at Richmond on a site provided by the Gas Light and Coke Company, by a company formed for the purpose, known as the Fuel Production Co. The latter company had received a guarantee under the Trade Facilities Act in respect of a loan of £100,000. The Gas Light and Coke Co. would act as managers for the fuel company and bear all the running expenses, and have an option to purchase the plant at the end of three years. Steps had been taken to safeguard the public interest in any patents that might be taken out as a result of this experiment, and full details of the plant and of the results obtained would be made available. The Fuel Research Board were taking a keen interest in the experiment.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

93 (*Electric Resistance Furnaces*)—"I should be much obliged if you could give me the names of the actual makers of electric resistance furnaces, overheated Type S, maximum temperature 1,300° C."

94 (*Fire Extinguishers*)—"We shall be glad if you will inform us whether there are any dry powder fire extinguishers on this market, and if so, the names and addresses of the manufacturers, and the trade name of the powder. If at the same time you could let us know the wholesale and retail prices these would be of great help."

From Week to Week

SWISS EXPORTS of chemicals, pharmaceuticals, and dyes in February were valued at 13,600,000 frs.

INDIAN INDIGO EXPORTS in February amounted to 176 cwt., compared with 54 cwt. in the parallel period last year.

FATAL INDUSTRIAL ACCIDENTS reported in Great Britain and Northern Ireland during March, 1928, included five in chemical factories.

WORKS SITES at Wakefield and close to Liverpool respectively are advertised by Brotherton and Co., Ltd. Further details are given in our advertisement columns, p. xxxviii.

THE INTERNATIONAL OIL, CHEMICAL AND COLOUR TRADES' EXHIBITION will be held at the Royal Agricultural Hall, Islington, from March 16 to Saturday, March 23, 1929.

ARTIFICIAL SILK NEWS.—At the general meeting of the Glanzstoff Co., Elberfeld, an increase in the ordinary capital of £750,000 and in the preference capital of £30,000 was approved.

NOBEL PRIZE WINNERS will this year receive a sum of 156,639 Swedish Kroner (about £8,700) each, according to a report recently published by the Nobel Foundation in Stockholm.

THE VACUUM OIL CO. is negotiating for the purchase of the control of the Medway Oil and Storage Co. The latter is a private company, with a capital of £305,000, formed in 1923.

PHOSPHERINE (ASHTON AND PARSONS), LTD., made an issue of 400,000 8 per cent. cumulative participating ordinary shares of £1 each at par on Monday. The issue was over-subscribed.

ITALIAN CITRIC ACID MANUFACTURERS have formed a syndicate, known as Cifag (or Consortio italiano fabbriche acido citrico), having quarters in Messina. The syndicate will probably attempt to depress prices.

DR. R. R. LE GEYT WORSLEY, formerly sub-director of the Chemical Section, Egypt, has been appointed by the Secretary of State for the Colonies to be chemist to the East African Agricultural Research Institute, Tanganyika Territory.

DISEASES OF OCCUPATIONS reported in Great Britain and Northern Ireland during March, 1928, under the Factory and Workshop Act, or under the Lead Paint (Protection Against Poisoning) Act, 1926, included one case of mercurial poisoning and four cases of aniline poisoning.

ABOUT 50 MEMBERS of the Nottingham section of the Society of Chemical Industry visited the Staveley Coal and Iron Co.'s Devonshire works on Thursday, April 19, and were shown over the chemical and by-product plant. The visitors were afterwards entertained to tea by the Staveley Co.

A REPORT on "Economic Conditions in the Banat and Transylvania during 1927" has been received in the Department of Overseas Trade from His Majesty's Consul at Timisoara, Rumania. Copies of the report can be obtained by interested United Kingdom manufacturers and exporters on application to the Department (Reference C.X. 2,717).

PERCENTAGE UNEMPLOYMENT among insured persons in Great Britain and Northern Ireland at March 26, 1928, in chemicals manufacture was 5·7 (decrease of 0·7 on March 21, 1927); in explosives manufacture, 5·8 (decrease of 1·8); in paint, varnish, japan, red and white lead manufacture, 4·0 (a decrease of 1·2); and in oil, grease, glue, soap, ink, match, etc., manufacture, 5·8 (decrease of 1·1).

THE SALES OF CHILEAN NITRATE in March totalled 254,000 tons, and it is expected that in April the sales will reach 260,000 tons. The year's production will probably reach 3,000,000 tons. Expecting an increase in demand, the Chilean Government is preparing to hand over for exploitation unexplored nitrate fields with a total capacity of 10,000,000 tons, where it is planned to construct plants capable of producing 500,000 tons annually. Two other concessions of similar capacity will also be granted.

MAJOR J. E. T. BARBARY, of West Trewirgie, Redruth (chief chemist to Bickford-Smith and Co., Ltd., of Tuckingmill) has recently returned from a tour in the United States and Canada, where he represented Imperial Chemical Industries, Ltd., in the fourth Biennial Safety Fuse Technical Conference at Simsbury, Connecticut, at the invitation of Ensign-Bickford and Co., safety fuse manufacturers, of that State. He also visited the Du Pont Powder Mills at Seranton, Pennsylvania, and the Canadian Safety Fuse Plant at Brownsville.

A MEETING OF POTGIETERSRUST PLATINUMS, LTD., will take place on May 22, at which shareholders will be asked to approve the acquisition of the properties of three other platinum companies—the Eerstegeluk Co., the Schildpadnest Association, and the Steelport Association. For the purchase of these properties the capital of the Potgietersrust Company is to be increased by £500,000 in 5s. shares to £2,000,000. The company is recovering, from an experimental plant, 600 oz. of platinum group metals per month from 2,400 tons of ore crushed, and a profit is being made on this small scale.

THE LAUTARO NITRATE CO. has purchased the "Pera Grande" and "Delamere" officinas of the du Pont de Nemours Co.

IMPORTS OF CHEMICALS, DRUGS, dyes, and colours into Malaya during 1927 totalled £2,519,172, compared with £2,596,959 in 1926.

MR. P. T. HARVEY has joined the board of the Brand Powdered Fuel System, and Mr. A. Sutherland has joined the staff as superintendent engineer of the marine department.

THE ANNUAL MEETING of the Federation of British Industries was held in London on Wednesday, when Sir Rowland Blades, ex-Lord Mayor of London, was elected president in succession to Lord Gainford.

BEET SUGAR NEWS.—Officials of the Selby beet sugar factory report that a sufficient acreage has now been contracted to secure a run equal to last year's, and plans are being made for the acceptance of a much larger acreage.

A GERMAN CELLULOSE SYNDICATE has been formed, to which will belong a large number of leading firms, including the Koholyth Co. Negotiations are in progress as regards arrangements with Czechoslovakia, Sweden, Norway, and Finland.

AN ISSUE will shortly be made by Solidol Chemical, Ltd., a company formed to manufacture Lysol in tablet form, and other preparations, and to acquire the business, patents, trade-marks, etc. of the Solidol Chemical Co. The products are already on the market.

FELLOWSHIPS (£250–£300 per year or higher), for chemists of post-graduate standing desirous of adopting a career in industrial chemistry, are offered by the Salters' Institute of Industrial Chemistry. Details are given in our advertisement columns, p. xxxvii.

APPLICATIONS FOR GRANTS from the Dixon Fund of the University of London, for assisting scientific investigations, accompanied by the names and addresses of two references, must be made to the Academic Registrar, University of London, South Kensington, London, S.W.7 (from whom further particulars may be obtained), before May 15.

REVISED ESTIMATES OF THE PRODUCTION OF CALCIUM CYANAMIDE in Germany made by Dr. N. Caro place the annual productions at 100,000 tons of nitrogen content. Production at Piestreitz is estimated at 42,000 tons of nitrogen per year, at Trostberg-on-Inn 47,000 tons, Waldshut 10,000 tons, and Hirschfelde and other smaller plants 1,000 tons.

UNEMPLOYED INSURED PERSONS at March 26 in Great Britain and Northern Ireland in chemicals manufacture numbered 5,264 (males 4,525, females 739); in explosives manufacture, 1,057 (males 732, females 325); in paint, varnish, japan, red and white lead manufacture, 730 (males 605, females 125), and in oil, grease, glue, soap, ink, match, etc., manufacture, 4,461 (males 3,614, females 847).

THE REPORT OF A PRELIMINARY INQUIRY (No. 2,903) into an explosion on November 3, 1927, from a steam-jacketed copper pan at the works of the Pharmaco-Chemical Products Co., Ltd., Burton-on-Trent, in which two men were scalded, states that the cause of the explosion was that the pan was subjected to a pressure greater than it was capable of withstanding.

THE FRANKLIN INSTITUTE committee on science and the arts proposes to award the Howard N. Potts Medal of the Institute to Dr. E. C. Sullivan and Mr. W. C. Taylor, of Corning, New York, for their invention of Pyrex glass, which was developed at the Corning Glass Works. The Howard N. Potts Medal (gold) is awarded for distinguished work in science or the arts; important development of previous basic discoveries; inventions or products of superior excellence or utilising important principles. The committee also recommend the award of the Walton Clark Medal to Mr. Arthur Graham Glasgow, of London, "in consideration of his outstanding and valuable work in the technology and development of the manufactured gas industry." Mr. Glasgow, of the firm of Humphreys and Glasgow, Ltd., of London, has been engaged for many years in the development of water-gas plant. The Walton Clark Medal (gold) is awarded to the author of the most notable advance in knowledge or improvement in apparatus or in method concerning the science or the art of gas manufacture and related matters.

Obituary

PROFESSOR JOHANNES GADAMER, director of the Pharmaceutical-Chemical Institute of the University of Marburg, on April 15, aged 61. He published a large number of papers dealing with his chemical researches, chiefly on alkaloids and glucosides (atropine, scopolamine, sinigrin, sinalbin, the corydaline alkaloids, berberine, ephedrine, cantharidine, ecgonine, etc.). He was editor of the *Archiv der Pharmazie*, and published a text-book of chemical toxicology and other works.

MR. HENRY ALLEN, a director of the Bleachers' Association, Ltd., aged 77.

MR. A. E. CRESSWELL, analyst in the Department of Health, Victoria, Australia, on February 24, following a bite from a poisonous insect.

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Some sulphur derivatives of aromatic methyl ethers. H. H. Hodgson and F. W. Handley. *J. Chem. Soc.*, March, pp. 625–628.

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The determination of traces of iodine. I. J. F. McClendon. *J. Amer. Chem. Soc.*, April, pp. 1093–1099.

APPARATUS.—An improved glass manometer. F. Daniels. *J. Amer. Chem. Soc.*, April, pp. 1115–1117.

Application of the photo-electric cell to automatic titrations. R. H. Müller and H. M. Partridge. *Ind. Eng. Chem.*, April 1, pp. 423–425. The solution being titrated by virtue of its colour, controls the amount of light falling on a photo-electric cell. The photo-current is amplified by a thermionic vacuum tube, and actuates a relay which in turn controls a burette release. The method should be important in steel analyses, large scale processes, etc.

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Absolute alcohol in industry. J. L. Gendre. *Chim. et Ind.*, March, pp. 396–401 (in French).

A study of the hygroscopicity of cellulose esters. A. Caille. *Chim. et Ind.*, March, pp. 402–406 (in French).

The state of our knowledge of the chemistry of lignin. III. G. Dupont. *Chim. et Ind.*, January, pp. 3–23; March, pp. 407–416 (in French).

ORGANIC.—The ethereal oil from *Agathis Australis*. J. R. Hosking. *Recueil Travaux Chim. Pays-Bas*, April 15, pp. 578–584 (in German).

Investigations on the saponins and related bodies. XX. Ursolic acid. (ii). The action of acetic anhydride on ursolic acid. A. W. van der Haar. *Recueil Travaux Chim. Pays-Bas*, April 15, pp. 585–590 (in German).

A general method of sulphonation. L. Gay, M. Auméras, and P. Mion. *Chim. et Ind.*, March, pp. 387–395 (in French).

Patent Literature

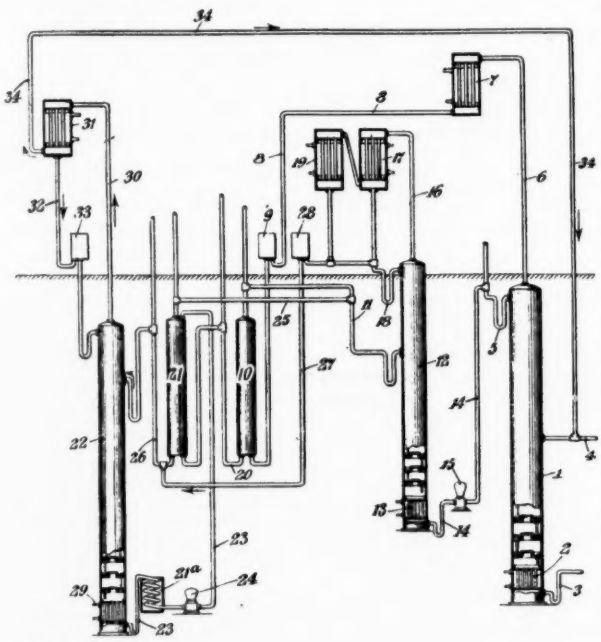
The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

287,604. Citric Acid, Production of. The Distillers Co., Ltd., 12, Torpichen Street, Edinburgh, and A. M. Peake, 319, Clapham Road, London, S.W.9. Application date, November 27, 1926.

It has been found that the production of citric acid during the growth of citrous fruits is due to enzymic action on pectinous or other similar substances, and in this invention citric acid is obtained from suitable raw material such as fruit pulp, wood dextrines, gums, and similar pectinous bodies, by the addition of the active enzymes of citrous fruit. The enzymes may be removed from the fruit and then added to the pulp or may be used as found in the fruit, if the essential oils which have an inhibiting effect on the enzymes are removed. The enzymes which form citric acid occur principally in the pith between the pulp of the fruit and the outer covering. If the pith itself is used, the outer layer which contains the essential oils must first be removed, and the enzymes may be extracted by a weak solution of an organic acid. The raw material may be apple or plum pulp, or solutions of gums, such as cherry gum, or wood dextrines, such as are obtained in the hydrolysis of wood by concentrated acids. The initial reaction is effected in a slightly acid medium, e.g., by the addition of citric acid, and the hydrogen ion concentration is maintained during the reaction by adding calcium carbonate. Small quantities of oxygen carrying catalysts such as manganese or titanium salt, may be present. The temperature may be 25°–35° C., and the material may be subjected to preliminary sterilisation by boiling, or by the addition to chloroform or toluene.

287,607. Purifying Liquids by Distillation, Process for. E. C. R. Marks, London. From U. S. Industrial Alcohol, Co., 110, East 42nd Street, New York. Application date, November 29, 1926.



287,607

The process is for recovering a liquid from a mixture with water which is adapted to form a constant boiling mixture with a third liquid, so that when distilled. the mixture separates into a number of layers on condensation. The process is applicable to the recovery of ethyl-, methyl-, propyl-, or butyl-alcohol, esters, such as methyl or ethyl acetates, or propionate, aldehydes, such as acetaldehyde, or ketones such as acetone, methyl-ethyl-ketone, or diethyl-ketone. The third liquid employed is preferably benzol, but haxane, heptane, aromatic or halogenated hydrocarbons such as carbon tetrachloride, ethylene dichloride, ethyl chloride or bromide, ethyl acetate or butyrate, butyl acetate or propionate, or amyl acetate may be used.

Alcohol vapour having a strength of 95 per cent. and temperature above 78·4° C. is fed through a pipe 4 into a column 1 heated by a coil 2 at the bottom, and benzol is fed in at 5 in approximately equal amount. The vapour passing out through the pipe 6 is a ternary constant boiling mixture containing about 74·1 per cent. benzol, 7·4 per cent. water, and 18·5 per cent. alcohol. The vapour passes to a condenser 7, and the condensate through a pipe 8 to a separating chamber 10, where it separates into two layers. The upper benzol layer contains 81 per cent. benzol, 15 per cent. alcohol, and 4 per cent. water, and the lower water layer contains 55 per cent. alcohol, 35 per cent. water, and 10 per cent. benzol. The upper layer passes through a pipe 11 to a benzol recovery column 12 from which pure benzol is drawn off at 14 to the top of the column 1. The vapour passes through a pipe 16 to a dephlegmator 17, having a return pipe 18 leading to the top of the benzol column, and connected also to a condenser 19. The lower layer passes from the separating chamber to a scrubber 21, where it is treated with water containing 1 per cent. of alcohol obtained from an alcohol recovery column 22 through a pipe 23. Two layers are formed in the chamber 21, the upper benzol layer passing out through a pipe 25, and the lower water layer passing out through the pipe 26 to the alcohol recovery column 22. The vapour from the column 22 contains 93 per cent. alcohol, 5 per cent. water, and 2 per cent. benzol, and passes through pipe 30 to dephlegmator 31. The uncondensed water vapour passes through pipe 34 back to the feed pipe 4, and the reflux passes through pipe 32 to the column 22.

Note. Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention :—261,757 (I.G. Farbenindustrie Akt.-Ges.) relating to condensation products and vat dyestuffs of the benzanthrone series, see Vol. XVI, p. 122 ; 261,786 (J. Trautmann) relating to synthesis, distillation, cracking, and hydrogenation of hydrocarbon oils, see Vol. XVI, p. 122 ; 263,179 (I.G. Farbenindustrie Akt.-Ges.) relating to thiomorpholines of the anthraquinone series, see Vol. XVI., p. 217, 263,198-9 (I. G. Farbenindustrie Akt.-Ges.) relating to active silica, see Vol. XVI, p. 218 ; 263,795 (I.G. Farbenindustrie Akt.-Ges.) relating to acid dyestuffs of the anthraquinone series, see Vol. XVI, p. 239 ; 264,502 (I.G. Farbenindustrie Akt.-Ges.) relating to grey to black dyestuffs, see Vol. XVI, p. 317 ; 269,133 (M. Stern) relating to nickel or ferro-nickel, see Vol. XVII, p. 7 (Metallurgical Section) ; 265,553 (Newport Co.) relating to tetrakisazo dyes, see Vol. XVI, p. 381 ; 275,220 (J. R. Geigy Akt.-Ges.) relating to azo dyestuffs, see Vol. XVII, p. 330 ; 276,617 (Soc. des Brevets Etrangers Lefranc et Cie) relating to butyric acid, see Vol. XVII, p. 399 ; 278,651 (I.G. Farbenindustrie Akt.-Ges.) relating to vat dyestuffs, see Vol. XVII, XVII, p. 536 ; 279,774 (Allgemeine Ges. für Chemische Industrie) relating to purification of liquid hydrocarbons by liquid sulphur dioxide, see Vol. XVII, p. 623.

International Specifications not yet Accepted

285,812. Dyes. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, February 21, 1927.

One molecule of a tetrazotised diamine containing carboxyl groups in *o*-position to the amino group is coupled with two molecules of an aceto-acetarylide sulphonic acid, or one molecule of a diazotised amine containing a carboxyl group in *o*-position to the amino group is coupled with one molecule of an aceto-acetarylide sulphonic acid, and the resulting monoazo dyestuff converted into a disazo dyestuff by treating

with phosgene, thiophosgene, or carbon bisulphide. Fast yellow, orange, and brown shades are obtained with these dyes. Examples are given of the coupling of tetrazotised 4 : 4^1-diamino-diphenyl-urea-3 : 3^1-dicarboxylic acid and acetoacet-*o*-chloranilide sulphonic acid, tetrazotised 4 : 4^1-diamino-diphenyl-3 : 3^1-dicarboxylic acid and acetoacet-1-naphthalide disulphonic acid. In another example, the nitro group of the monoazo dyestuff 5-nitro-2-aminobenzoic acid→(alkaline) acetoacet-*o*-anisidide sulphonic acid is reduced, and the product treated with phosgene.

285,833. Isomeric Thymols and Menthols. Schering-Kahlbaum Akt.-Ges. (formerly Chemische Fabrik auf Actien, vorm. E. Schering) 170, Müllerstrasse, Berlin. International Convention date, February 22, 1927. Addition to 279,856. (See The Chemical Age, Vol. XVIII, p 14.)

Crude cresol and acetone are condensed and hydrogenated and the products separated by fractional distillation. In one example the condensation product is treated as described in specifications 273,685 or 279,855 (see The Chemical Age, Vol. XVII, p. 222, and Vol. XVIII, p. 14) and the mixture of thymol and *p*-thymol fractionated in vacuo. In another example, the condensation product is heated to obtain a mixture of 3- and 4-methyl-6-isopropylene-phenols, which is hydrogenated under pressure with a manganese catalyst and then fractionally distilled in vacuo to obtain *m*-menthol.

285,840. Dyes. Soc. Anon. des Matieres Colorantes et Produits Chimiques de St. Denis, 105, Rue la Fayette, Paris, R. Lantz, 226, Rue la Fayette, Paris, and A. Wahl, 14 bis Boulevard Cotte, Enghien, Seine-et-Oise, France. International Convention date, February 22, 1927.

Phenylimino-β : α : β^1 : α^1-symmetrical dinaphthoxazine and the unsymmetrical compound are treated with aniline, *p*-or *o*-toluidine, anisidine, or *p*-phenylene-diamine. The *meso*-phenylphenylimino-α : β : α^1 : β^1-dinaphthazine obtained in the first case may be sulphonated. Naphthylimino and other arylimino-dinaphthoxazines may be similarly treated.

Latest Notifications.

288,592. Process for the production of figured, plain, and multi-coloured strips from cellulose derivatives. I.G. Farbenindustrie Akt.-Ges. April 13, 1927.

288,569. Recovery of titanium compounds. Titanium Pigment Co., Inc. April 12, 1927.

288,571. Process for the manufacture of 5-iodo-2-amino pyridine. Schering-Kahlbaum Akt.-Ges. April 12, 1927.

288,572. Process for the manufacture of a new diazo compound and of new dyestuffs derived therefrom. Compagnie Nationale de Matières Colorantes et Manufactures de Produits Chimiques du Nord Réunies Etablissements Kuhlmann. April 12, 1927.

288,972. Process for the manufacture of new aromatic N-amino-alkyl-amino aldehydes and derivatives thereof. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

288,973. Process for the refining of chromium ores. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

288,628. Process for the manufacture of hydroxy-pyridine compounds. Schering-Kahlbaum Akt.-Ges. April 14, 1927.

288,629. Manufacture of halogen derivatives of pyridine. Schering-Kahlbaum Akt.-Ges. April 14, 1927.

288,549. Manufacture of carboxylic acid anhydrides. Consortium für Elektro-Chemische Industrie Ges. April 11, 1927.

288,554. Manufacture of vat-dyestuffs. I.G. Farbenindustrie Akt.-Ges. April 11, 1927.

288,555. Process for the manufacture of basic phenol alkyl ethers. I.G. Farbenindustrie Akt.-Ges. April 11, 1927.

288,612. Manufacture and production of sulphonic acids derived from non-aromatic carboxylic acids. I.G. Farbenindustrie Akt.-Ges. June 21, 1926.

288,977. Process for the manufacture of metal sulphates from sulphides. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

288,983. Process for the manufacture of azo dyestuffs capable of after-treatment with metallic salts. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

288,985. Manufacture of benzanthrone-peri-dicarboxylic acid or its derivatives or substitution products. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

288,986. Manufacture of hydroxythio-naphthenes. I.G. Farbenindustrie Akt.-Ges. April 16, 1927.

Specifications Accepted with Date of Application

265,170. Aluminium, Manufacture of. Aluminium Industrie Akt.-Ges. January 27, 1926.

265,203. Mordant dyeing dyestuffs, Manufacture of. J. R. Geigy Akt.-Ges. January 28, 1926.

267,162. Dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. March 8, 1926.

269,594. Fuel gas, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 19, 1926.

273,718. High per cent. nitric acid, Production of. N. Caro and A. R. Frank. June 29, 1926.

279,506. Diacidyl derivatives of naphthalene and acenaphthene, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 23, 1926.

288,346. Condensation products of urea and formaldehyde, Production of. I.G. Farbenindustrie Akt.-Ges. October 1, 1926. Addition to 258,289.

288,358. Dyes. B. Wylam, J. E. G. Harris, J. Thomas, and Scottish Dyes, Ltd. December 29, 1926.

288,366. New pharmaceutical compounds, Manufacture of. I.G. Farbenindustrie Akt.-Ges., K. Schranz, and C. Lutter. January 6, 1927. Addition to 242,296.

288,370. New antimony compounds, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) January 7, 1927. Addition to 271,940.

288,390. Inorganic potassium salt, betaine salt, and glutamic acid from the waste liquor produced in distilling alcohol from fermented beet molasses, Method of collecting. Y. Takayama. January 22, 1927.

288,436. Installations for recovering ammonia from ammoniacal liquor. South Metropolitan Gas Co., P. Parrish, F. C. Snelling, and O. W. Weight. April 15, 1927.

288,441. Cyclic ketones of the aromatic series, Manufacture of. O. Y. Imray (*I.G. Farbenindustrie Akt.-Ges.*) April 26, 1927.

Applications for Patents

Bennett, A. N. C. B. Laporte, Ltd., and Weber, I. E. Manufacture of titanium pigments. 11,358, 11,359. April 17.

Blagden, J. W., Clark, G. C. H., and Howards and Sons, Ltd., Manufacture of catalysts. 11,691. April 20.

British Cyanides Co., Ltd., and Rossiter, E. C. Manufacture of formaldehyde condensation products. 11,603. April 19.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphur dyestuffs. 11,716. April 20.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Regenerating active silicic acid. 11,717. April 20.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of anthraquinone condensation products. 11,718. April 20.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of artificial rubber, etc. 11,789. April 21.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. (Telefunken Ges. für Drahtlose Telegraphie). Picture-telegraph, etc., systems. 11,823. April 21.

Coley, H. E. Production of hydrocarbons. 11,777. April 21.

Coley, H. E. Manufacture of zinc oxide. 11,778. April 21.

Dreyfus, H. Manufacture of aliphatic compounds. 11,444. April 18.

Dreyfus, H. Manufacture of cellulose derivatives. 11,445, 11,446. April 18.

Firing, L., and B. Laporte, Ltd. Manufacture of barium titanate. 11,357. April 17.

Franklin, R. G. Production of methanol, etc. 11,675. April 20.

Hercules Powder Co. Digestion of nitro-cellulose. 11,711. April 20. (United States, February 23.)

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of hydrocarbons. 11,190. April 16. (March 10, 1927.)

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of viscous oils. 11,458. April 18.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of mixed fertilisers. 11,459. April 18.

I.G. Farbenindustrie Akt.-Ges. Dehydration of moist fuels. 11,191. April 16.

I.G. Farbenindustrie Akt.-Ges. Manufacture of azo dyestuffs. 11,193. April 16. (Germany, April 16, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of benzanthrone-peri-dicarboxylic acid, etc. 11,197. April 16. (Germany, April 16, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of hydroxythio-naphthenes. 11,198. April 16. (Germany, April 16, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of phosphorus from ferro-phosphorus. 11,246. April 16. (Germany, May 21, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of shaped masses from cellulose derivatives. 11,692. April 20. (Germany, April 22, 1927.)

Imperial Chemical Industries, Ltd., Rodd, E. H., and Sharp, F. L. Triarylmethane dyestuffs. 11,461. April 18.

Imperial Chemical Industries, Ltd. Production of carbon. 11,554. April 19.

Imperial Chemical Industries, Ltd., Shepherdson, A., and Tatum, W. W. Anthraquinone dyes, etc. 11,615. April 19.

Imperial Chemical Industries, Ltd., and Smith H. G. Production of methanol, etc. 11,675. April 20.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d. according to purity strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 6d. to 1s. 11d. per gall.; pyridinised industrial, 1s. 8d. to 2s. 1d. per gall.; mineralised, 2s. 7d. to 2s. 11d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, 2s. 3d. to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—2s. 8d. to 3s. per gall. 97/99.—2s. 7d. to 2s. 8d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works; Crude, 8d. to 8½d. per gall.; Standard Motor, 1s. 0½d. to 1s. 1d. per gall.; 90%, 1s. 1½d. to 1s. 2d. per gall.; Pure, 1s. 5d. to 1s. 6d. per gall.

TOLUOLE.—90%, 1s. 4d. to 1s. 8d. per gall. Firm. Pure, 1s. 6d. to 1s. 8d. per gall.

XYLOL.—1s. 3d. to 2s. per gall. Pure, 2s. 4d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 7¾d. to 8¼d. per gall. Heavy, 8¼d. to 8¾d. per gall. Standard specification, 7¼d. to 7½d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 7¼d. to 7¾d. per gall. Solvent 90/160, 10d. to 10½d. per gall. Solvent 95/160, 10½d. to 1s. 4d. per gall. Solvent 90/190, 9½d. to 1s. 2d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 62s. 6d. to 67s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. 6d. to 7s. per gall. 90/180, 3s. to 5s. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. 1½d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers

ACID, ACETYL SALICYLIC.—2s. 6d. to 2s. 7d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. to 2s. 3d. per lb. Less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 2d. to 1s. 3d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—8s. to 8s. 3d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—11s. 4d. to 11s. 7d. per lb.
BISMUTH CITRATE.—10s. 4d. to 10s. 7d. per lb.
BISMUTH SALICYLATE.—10s. 7d. to 10s. 10d. per lb.
BISMUTH SUBNITRATE.—9s. 7d. to 9s. 10d. per lb.
BISMUTH NITRATE.—6s. 7d. to 6s. 10d. per lb.
BISMUTH OXIDE.—14s. 7d. to 14s. 10d. per lb.
BISMUTH SUBCHLORIDE.—14s. 4d. to 14s. 7d. per lb.
BISMUTH SUBGALLATE.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. 1d. to 2s. 3d. per lb.; potassium, 1s. 9½d. to 1s. 11½d. per lb.; sodium, 2s. to 2s. 2d. per lb.; granulated ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—1s. 2d. to 1s. 3d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11½d. to 1s. 0½d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 5d. to 2s. 8d. per lb. Green, 2s. 8d. to 3s. 1d. per lb.; U.S.P., 2s. 6d. to 2s. 9d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8¾d. to 9¼d. per oz.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 17s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.
METHYL SULPHONAL.—9s. to 9s. 3d. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—102s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 5d. to 2s. 6d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—2s. to 2s. 3d. per lb., B.P.C., 1923—2s. 5d. to 2s. 6d. per lb. U.S.P., 2s. 3d. to 2s. 6d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 7d. to 1s. 9d. per lb. Crystal, 1s. 7½d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—10s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—8s. 3d. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—35s. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—24s. per lb.
BOURBON GERANIUM OIL.—16s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. 9d. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CASSIA OIL, 80/85%.—8s. per lb.
CITRONELLA OIL.—Java, 1s. 10d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 9d. per lb.
CLOVE OIL.—5s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 16s. per lb.
LEMON OIL.—9s. 6d. per lb.
LEMONGRASS OIL.—4s. 3d. per lb.
ORANGE OIL, SWEET.—14s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 62s. 6d. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. 9d. per lb.; Japanese, 7s. 3d. per lb.
PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, April 26, 1928.

BUSINESS has continued in a satisfactory state during the past week, and prices show an upward tendency. Export trade is also improving.

General Chemicals

ACETONE remains firm at £65 to £67 per ton.

ACID ACETATE is steady at £37 to £38 per ton for 80% grades, with good demand.

ACID FORMIC.—Improved demand, price £47 per ton for 85%.

ACID LACTIC.—Unchanged.

ACID OXALIC.—Price is firm at £31 to £32 per ton with fair demand.

ACID TARTARIC is in little better demand, and price firm at 1s. 4½d. to 1s. 5d. per lb.

AMMONIUM CHLORIDE.—Unchanged.

ALUMINA SULPHATE.—Prices are advancing at £6 to £6 5s. per ton for 17/18%.

ARSENIC.—Unchanged.

BARIUM CHLORIDE.—Unchanged at £8 to £8 5s. per ton, with position firm.

COPPER SULPHTAE.—Unchanged.

CREAM OF TARTAR.—The position is still very firm, price unchanged at about £104 per ton for 99/100%, less 2½%.

FORMALDEHYDE is in steady demand at £39 per ton, in casks.

LEAD ACETATE is firm at about £41 to £42 per ton for white and £1 per ton less for brown, with steady demand.

LEAD NITRATE.—Unchanged.

LIME ACETATE.—Unchanged.

METHYL ACETONE continues in short supply, and price unchanged at £56 to £58 per ton for 45%.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged.

POTASSIUM CHLORATE.—Unchanged.

POTASSIUM PERMANGANATE.—The position is very firm, price unchanged at about 5½d. per lb. for B.P. Commercial quality about ½d. per lb. less.

POTASSIUM PRUSSIATE.—Unchanged at £59 to £63 per ton.

SODA ACETATE continues very firm and in short supply at £22 per ton.

SODA BICHROMATE.—Position firm, price unchanged at present.

SODA CHLORATE.—Demand continues active, price unchanged at £28 to £30.

SODA HYPOSULPHITE.—Unchanged.

SODA NITRITE.—Very firm at £20 to £22 per ton.

SODA PHOSPHATE.—Unchanged.

SODA PRUSSIATE.—Unchanged at 4½d. to 5¼d. per lb., according to quantity.

SODA SULPHIDE.—Unchanged.

TARTAR EMETIC.—In good demand at 11½d. to 11¾d. per lb.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

THE recent duty of 4d. per gallon imposed on petrol by the Budget will have an effect on benzols, solvent naphtha and heavy naphtha, and as the prices for these products have not yet been established, we regret that we shall have to refrain from quoting market prices until such time as the market for these products has become more stabilised.

CREOSOTE OIL is unchanged from last week, the price remaining at about 7d. per gallon on rails in the North, and 7½d. per gallon in London.

CRESYLIC ACID remains weaker, the 98/100% quality being quoted at 2s. 6d. per gallon at works, naked, and the dark quality, 95/97%, at 1s. 11d. per gallon.

NAPHTHALENES are unchanged, the 74/76 quality being quoted at £6 10s. per ton, and the 76/78 quality at £7 10s. to £8 per ton.

PITCH remains quiet, and what little demand there was has slackened off; the price remains at about 65s., f.o.b.

Latest Oil Prices

LONDON, April 25.—LINSEED OIL firm and 5s. to 7s. 6d. per ton higher. Spot, ex mill, £31; April, £30 5s.; May-Aug., £30 12s. 6d.; September-December, £31 12s. 6d. RAPE OIL steady. Crude extracted, £41; technical refined, £43, naked, ex wharf. COTTON OIL quiet. Egyptian crude, £35; refined common edible, £40; deodorised, £42, naked. TURPENTINE quiet and 3d. per cwt. lower. American, spot 37s. 9d.; May-June, 37s. 9d.; July-December, 38s. 3d. per cwt., tax to buyer's account.

HULL, April 25.—LINSEED OIL.—Spot and April, £29 15s.; May-August, £30 5s.; September-December, £31 5s. per ton, naked. COTTON OIL.—Bombay crude, £32; Egyptian crude (new), £33 15s.; edible refinded, £37 10s.; technical, £36; deodorised, 39s. 10s. PALM KERNEL OIL.—Crushed, 5½ per cent., £38. GROUNDNUT OIL.—Crushed/Extracted, £39; deodorised, £43 per ton. SOYA OIL.—Crushed and extracted, £33; deodorised, £36 10s. RAPE OIL.—Crude/Extracted, £40; refined, £42 per ton. COD OIL, TURPENTINE and CASTOR OIL unaltered.

Nitrogen Products

Export.—The prices for sulphate of ammonia remain unchanged on the Continent and in the United Kingdom. There is a sharp rise in the American price, which has reached $2.90 to $2.95 per 100 lb. in bulk, delivered in the north. Sales in all countries appear to be satisfactory, and it is not expected that the stock carried over into the new season will be unusually large, despite the vast increase in production during the year.

Home.—The home demand continues satisfactory. Merchants in all parts of the country are still placing orders for immediate delivery. Of course, the volume of deliveries is now smaller than a month ago, but the consuming season is far from over.

Nitrate of Soda.—Although the price in the European markets remains unchanged, there has been a further fall in the price f.a.s. Chile, which has been reduced to 16s. per metric quintal.

South Wales By-Products

PITCH continues in good demand in South Wales. More buyers are in the market and there is a steady call for the product round about 62s. to 67s. per ton f.o.r. Creosote is fairly steady round about 7¼d. to 8¼d. per gallon f.o.r. maker's works, while solvent naphtha is unchanged at from 8d. to 9d. per gallon on rail. Crude tar is fairly easy round about the 50s. per ton f.o.r. mark, and refined tars are in steady, if moderate, demand, with prices unchanged. Patent fuel and coke exports are on a fairly satisfactory basis. Prices of patent fuel have fallen slightly in Cardiff, selling at 21s. to 22s. 6d., a general quotation fall of 6d. a ton, but Swansea prices are unchanged at 20s. 3d. to 20s. 9d. per ton, ex ship. Coke, best foundry, continues to sell at from 32s. 6d. to 37s., and other sorts from 25s. to 32s. 6d. per ton. Oil imports during the four weeks ended April 17 amounted to 23,105,440 gallons.

German Tar Product Prices

The Consul-General at Cologne states that the increase in the supply of raw tar as compared with previous years has partly been the cause of the price of tar being reduced on the open market. The average price is about 7 reichsmarks per 100 kgs. There is still a shortage of orders for pit coal briquettes which is likely to prevent an increase in the price of pitch. The demand for every description of tar oil is good. Increasing production abroad has led to a logical reduction in the price of creosote oil. The world market price is quoted at R.M. 140 per ton, f.o.b. port of shipment. In naphthalene and anthracene a steady but quiet business is reported. Raw naphthalene costs R.M. 110–120 and pure naphthalene R.M. 250–300 per ton, according to purity and the purpose for which it is used. Anthracene residues are being sold on the market from R.M. 55–60. As business in carbolic acid and cresol is brisk considerable price improvements have occurred in these products in comparison with the autumn of 1927. The position as regards benzol, both as to sales and prices, has now improved as a result of the recent settlement of the struggle between petrol and benzol interests.

Canadian Superphosphate

SIX car loads of super-phosphate produced at the small plant recently erected at the Tadanac smelter of the Consolidated Mining and Smelting Co., Ltd., at Trail, B.C., are now being distributed to farms on the prairies for testing as a fertiliser. The material is produced from great beds of phosphate rocks recently opened up in the neighbourhood of Fernie, B.C., and if the tests prove successful the company will embark upon the manufacture of the fertiliser on a large scale. The experiments are being carried out over a widespread area ranging from Alberta to Manitoba.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, April 25, 1928.

BUSINESS in the heavy chemical market still remains rather quiet in respect of actual orders placed, but there is a fair amount of inquiry both for home and export. Prices are steady.

Industrial Chemicals

ACETONE, B.G.S.—£64 to £67 per ton, ex store according to quantity.

ACID ACETIC.—98/100% glacial £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powdered, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In good demand and fairly firm at 6¾d. per lb., delivered.

ACID CITRIC, B.P.—Quoted 1s. 11¾d. per lb., less 5%, ex store, spot delivery. Rather cheaper to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the continent at 3¾d. per lb., ex wharf. Spot material quoted 3¾d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality. £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Nominally 1s. 4¼d. per lb. less 5%, ex wharf, but demand not so great, and some spot parcels could probably be obtained for less.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 10s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Spot material available at about £9 per ton, ex store. Crystal meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quality.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station; continental, about £19 per ton, c.i.f. U.K. ports. Fine white crystals of continental manufacture quoted £16 15s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Quoted £19 7s. 6d. per ton, ex wharf, prompt despatch from mines. Spot material available at £20 5s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers £6 12s. 6d. per ton, delivered, minimum four-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Continental price unchanged at about £25 per ton, c.i.f. U.K. ports. Some British material available at about £25 per ton, ex store.

FORMALDEHYDE, 40%.—Offered at £35 10s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—Quoted £31 10s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports; brown £38 10s. per ton, c.i.f. U.K. port. Spot material on offer at £42 15s. per ton, ex store, spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

METHYLATED SPIRIT.—Industrial quality, 64° O.P., quoted 1s. 7d. per gallon, less 2% delivered.

POTASSIUM BICHROMATE.—4¼d. per lb. delivered, minimum 4-ton lots. Under 4-ton lots, ½d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Rather scarce for immediate delivery. Quoted £25 10s. per ton, ex wharf. Spot material about £26 10s. per ton, ex store.

POTASSIUM CHLORATE, 99/100%.—Now on offer at £23 15s. per ton, c.i.f. U.K. ports. Crystals, 30s. per ton extra. B.P. quality, crystals or powder quoted £32 per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6⅜d. per lb.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid 76/77%, £14 10s. per ton; 70/72%, £13 12s. 6d. per ton; minimum 4-ton lots carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—In good demand and spot material scarce. Now quoted £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb. delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots, 3 1/16d. per lb. Under 2-ton lots, 3¼d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Quoted £11 per ton ex store.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and prict unchanged at about 4¼d. per lb., ex store. Offered for prompe shipment from the Continent at 4¼d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Prices, 50s. per ton, ex works, for unground quality; 52s. 6d. per ton delivered. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices now as follows:— Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £9 2s. 6d. per ton, delivered buyers' works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; floristella, £9 10s. per ton; ground American, £9 5s. per ton, ex stoie. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material quoted £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Japan Chemical Industry Co.'s Reorganisation

THE Japan Chemical Industry Co. has undergone a considerable reorganisation under new direction. The potassium chlorate factory in Aizu has been sold to the Koriyama Electric Co., and the phosphorus factory in Koriyama to the International Match Co. The company retains only the Kameido works, where various chemicals and fertilisers are manufactured. Apart from this, iodine is manufactured from seaweed, but this is not profitable. The company will use part of the proceeds of the sale of the Aizu factory (1.3 million yen) for the development of potassium chlorate manufacture.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, *April 26, 1928.*

There is a fairly steady call on this market for contract deliveries of a good many lines of heavy chemicals, and sellers report a not unsatisfactory flow of specifications. In the spot market, however, business this week has only been on a moderate scale, although in the aggregate sales have probably been up to the level of the past week or two. There are, however, a fair number of inquiries in circulation and a good proportion of these relate to extended delivery business.

Heavy Chemicals

With regard to hyposulphite of soda, a quiet trade in this material continues to be reported here, with sales of the commercial product being made at from £9 5s. to £9 10s. per ton, and of the photographic grade at about £16 10s. Caustic soda is a firm section at from £13 7s. 6d. to £14 7s. 6d. per ton, according to quality, a quiet contract business on this basis being put through. Only a moderate demand is reported in the case of chlorate of soda, and the tendency is still easy, although at round 2¾d. per lb. the price position is more or less what it was a week ago. Saltcake has met with a fair amount of inquiry this week, and offers are steady on the contract basis of £2 12s. 6d. per ton. Sulphide of sodium is rather inactive section ; for the 60-65 per cent. concentrated solid material quotations this week have ranged from £9 10s. to £10 per ton, the commercial quality being obtainable in the neighbourhood of £8 per ton. Bichromate of soda is in quietly steady request at from 3¼d. up to 3½d. per lb., according to quantity. Prussiate of soda is moving off in moderate quantities, and values are steady and about unchanged at round 4¼d. per lb. A fair business is reported in bicarbonate of soda at firm prices, these being in the neighbourhood of £10 10s. per ton. Bleaching powder is still on the contract basis of £7 per ton, but the demand this week has not been particularly active. Alkali meets with a fair amount of inquiry, and is still on offer by makers at £6 2s. 6d. per ton. Phosphate of soda is in somewhat quiet demand, but at up to £12 10s. per ton, prices in this section keep fairly steady. With regard to nitrate of soda, this is in fair request at firm prices up to £19 5s. per ton being quoted here during the past week.

There is a moderate inquiry about for caustic potash, offers of which are fully maintained at £33 5s. per ton for prompt delivery of one to five-ton lots. Carbonate of potash is quoted at about £25 5s. per ton, and a fair amount of interest in this material has been shown. Yellow prussiate of potash keeps steady at about 6⅜d. per lb., but the demand for this during the past week has been on rather quiet lines. Permanganate of potash is attracting limited attention, with the B.P. grade currently quoted at about 5¼d. per lb., and the commercial material at 4d. to 4¼d. per lb. Chlorate of potash is in quiet demand, but values are on the easy side at from 2⅞d. to 3d. per lb. Bichromate of potash is well held and a moderate business is being put through at round 4¼d. per lb.

Arsenic has attracted no more attention than of late, but at about £17 5s. per ton, at the mines, for white powdered Cornish makes, there has been little change in the price situation. Sulphate of copper is quite firm at from £26 15s. to £27 per ton, f.o.b., and a fair export business in this material is being done. A quiet trade is passing in the case of the acetates of lead, the values of which are fairly steady at £38 to £39 per ton for the brown material and £40 for the white. Nitrate of lead is slow, but offers of this are still at about £37 per ton. A certain amount of easiness is still to be observed in respect of the acetates of lime, grey quality offering at about £15 15s. per ton, and brown at £9 10s. to £10.

Acids and Tar Products

Firmness continues to be a marked feature of the acid section in most instances, and particularly so in tartaric and citric acids, current offers of which are at 1s. 4d. to 1s. 4¼d. and round 2s. per lb. respectively. A quietly steady demand is reported in acetic acid, and offers of this are steady at about £37 10s. per ton for the commercial 80 per cent. quality, and £66 for the glacial. With regard to oxalic acid a moderate inquiry for this is being experienced, and quotations are held at from 3¼d. to 3½d. per lb., according to quantity.

The tar products are quiet on the whole, and in few instances is there anything resenbling activity. Although slow, pitch keeps fairly steady at £3 2s. 6d. per ton, f.o.b. Carbolic acid is rather firmer for crude, which is quoted at 2s. 5d. to 2s. 6d. per gallon ; crystal is quiet and about unchanged on the week at round 6½d. per lb. A moderate business is passing in creosote oil at round 7¼d. per gallon.

New Process for the Production of Barium Sulphate

A new process for the extraction of practically pure barium sulphate from barytes ores is being demonstrated by Mr. Edward Doty, president of the R. K. Miller Minerals Corporation, Washington, and Cartersville, Ga. This process, which is patented, is based on the property of molten sodium chloride of dissolving and holding barium sulphate in solution to the exclusion of other minerals present in the ores treated. The barium sulphate is obtained by the simple operation of dissolving out the salt in water, and is said to be remarkably white and in the finest desired physical state.

Mr. Doty says that all tests made with various ores, including those generally classified as " off colour," yield uniformly good results and a product finer and whiter than he has yet seen produced by any other process. He points out that no grinding, acid treatment, or any other operations are required on the products after separation and washing in clean water and drying. Estimates of the cost of production indicate a considerable saving over other methods of producing finished barytes. Development of the process on a commercial scale is now under consideration.

Nominations to the Council of the S.C.I.

The following members of the Council of the Society of Chemical Industry will retire from their offices at the close of the annual general meeting :—Mr. F. H. Carr, president ; Dr. W. R. Hodgkinson, Dr. A. E. Mcintyre, Sir W. J. Pope, Mr. E. Thompson, vice-presidents ; Mr. J. Allan, Mr. J. L. Baker, Professor C. S. Gibson and Dr. H. H. Morgan, ordinary members. Mr. Arthur D. Little, of Cambridge, Mass., U.S.A., as already announced, has been nominated for election as president. Sir E. A. Brotherton, Mr. F. H. Carr, Mr. A. E. MacRae and Professor J. C. Phillip have been nominated vice-presidents. Dr. E. W. Smith has been re-elected hon. treasurer and Dr. E. F. Armstrong has been elected hon. foreign secretary.

Big Claims for New French Steel

Reports from France state that a discovery of great importance has been communicated to the Academy of Sciences by M. Léon Guillet, who already enjoys a considerable reputation on account of his metallurgical researches. He has now produced a new steel which, it is claimed, is practically indestructible. This " nitrate steel " is claimed to be harder than chrome or nickel steel. The use of this metal is said to effect a great saving in lubricating oil. Practical tests showed that, while with ordinary metal the oil consumption of the motor varied from nine grammes per horse-power-hour to twelve or fifteen grammes after 100 hours' running, it remained constant at four or five grammes with the new metal.

American Institute of Chemistry Meeting

The study of life processes, public health, farm relief through science, and national defence will figure prominently in discussions by the Institute of Chemistry of the American Chemical Society, which is to hold its second annual session at Northwestern University, Evanston, Ill., July 23 to August 18. Twenty-eight conferences, in which scientists from the universities and the industries will describe developments in various fields of chemistry, will take place. Professor F. C. Whitmore, chairman of the Division of Chemistry and Chemical Technology of the U.S. National Research Council, is director of the Institute. Among the visitors to the meeting will be Sir James C. Irvine, principal and vice-chancellor of the University of St. Andrews, who will deliver various lectures.

Company News

WEARDALE LEAD CO.—An interim dividend of 2½ per cent., less income tax, for the half-year, was payable on April 26.

ARIZONA COPPER CO.—A dividend for the year to March 31 last of 9d. per share, less tax, is announced on the ordinary shares, payable on June 1.

ERINOID.—The directors have declared an interim dividend on account of the year ending August 31, 1928, of 3 per cent., less tax, payable on or after May 7.

PARKES, CHEMISTS.—The report for the year ended February 29, 1928, states that after the allowances for depreciation of leases has been met, as well as £1,225 expended on repairs, etc., there remains £8,771. The directors have appropriated for fixtures depreciation reserve fund £557, leaving £8,214. A final dividend of 5 per cent., less income tax, is recommended on the ordinary shares, making, with the interim dividend of 2½ per cent., less income tax, 7½ per cent. for the year, carrying forward £1,332.

DUBARRY PERFUMERY CO.—The report for the year ended December 31st, 1927, states that the net profit is £53,811, to which is added the amount brought forward of £4,757, making £58,568. To staff bonus is allocated £2,649, and income tax account £3,391, while to the reserve fund, bringing that fund up to £60,000, is placed £10,000. The directors recommend a further dividend at the rate of 50 per cent. (less tax) on the ordinary shares, making, with the interim dividend of 25 per cent. (less tax), 75 per cent. (less tax), for the year, carrying forward £8,328.

ILFORD, LTD.—At a meeting of the board held on April 19 it was decided to recommend to the shareholders a bonus share distribution at the rate of one fully-paid ordinary share to every ten such shares held to those members registered at the closing of the books of the company on Wednesday, May 2. In order to give effect to this proposal, the directors have transferred the sum of £22,200 from the available profits of the company to the reserve fund, thus bringing this fund up to £52,200. An extraordinary general meeting is called for May 2 to pass the necessary resolution to capitalise the sum of £52,200, and appropriate such sum for this purpose.

UNITED WATER SOFTENERS, LTD.—For the year ended December 31, 1927, the report states that the profit for the period in question is £20,977, and after making provision for income-tax and year's dividend paid on the preference shares and also including £1,528 brought forward, the amount available is £17,736. The directors again recommend a dividend on the ordinary shares of 2s. per share, free of income tax, and also recommend writing £5,098 off patents, licences, etc., in addition to £6,000 previously appearing as "reserve account"—which has already been transferred—and carrying forward £2,637. The annual meeting will be held at Aldwych House, London, on April 30, at 12 noon.

BRAND POWDERED FUEL SYSTEM.—The statutory report states that the total number of shares allotted is 100,000 ordinary shares of £1 each. On each of these £1 per share is presently payable in cash. The total amount received in respect of shares issued wholly for cash is £98,769. The receipts on capital account and payments made thereout up to April 10, 1928, are as follows: Receipts—ordinary shares, signatories, £7; application, allotment and final instalment, £98,762; total, £98,769. Payments—on account of preliminary expenses, £2,500; revenue payment (less receipts), £122; balance at bank, deposit account, £90,000; current account, £6,147; total, £98,769. The estimate of preliminary expenses is £3,536.

BRYANT AND MAY, LTD.—The net profit for the year to March 31 last, amounted to £412,758, against £387,212 last year, and £72,415 was brought in, making a total of £485,173. The directors recommend placing to credit of reserve fund £50,000, and paying final dividends on the ordinary shares of 4 per cent., free of income tax, making 10 per cent. for the year, and on the partnership shares of 5 per cent., free of income tax, making 10 per cent. for the year. The ordinary shareholders get a further 10 per cent., free of income tax, and the employés' proportion, in addition to the share dividend, is £48,872, the carry-forward being £86,514. A sum of £100,000 has been written off properties, buildings, plant, machinery, etc., account.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the registration of the following Trade Marks can be lodged up to May 11, 1928.

"DECARMONOX."

484,781. Class 1. Mixtures of manganese dioxide and copper oxide for use in respirators for the oxidation of carbon monoxide to carbon dioxide. Robert Henry Davis, 187, Westminster Bridge Road, London, S.E.1; engineer. October 10, 1927.

"SUNNAC."

487,786. Class 1. Paints and enamels, varnishes and lacquers, all being in the nature of paints. The Willesden Varnish Co., Ltd., 26, Hythe Road, Willesden, London, N.W.10; manufacturers. January 20, 1928.

"PYRESIT."

487,929. Class 1. Cements for lining furnaces and for similar purposes. Naamlooze Venootschap Compagnie (a joint stock company organised under the laws of Holland), 1B, Stationplein, Rotterdam, Holland; manufacturers and merchants. January 25, 1928.

"ODISKO."

488,421. Class 1. Dyes. William Graham Nelson and Gilbert James Steven Wilson, trading in co-partnership, 15A, Fairley Street, Govan, Glasgow; manufacturers. February 11, 1928.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

CHEMICAL MANURES.—The Ministry of Agriculture in Cairo is inviting tenders to be submitted by 11 a.m., June 5, 1928. (Reference 26711/28.)

CHEMICALS, LINSEED OIL, ETC.—A firm of agents in Constantinople desire to secure the representation of British manufacturers of potash alum, ammonium carbonate, copper sulphate, iron sulphate, white and yellow arsenic, potassium bichomrate, borax, white lead, citric and tartaric acids, sal-ammoniac, naphthalene, lithopone, linseed oil and zinc boiler plates. (Reference No. 386.)

Tariff Changes

CZECHOSLOVAKIA.—The Customs import duty on sulphate of ammonia has been fixed at the reduced rate of 21·60 Czech kronen per 100 kgs. An order of December 13 contains a schedule of valuation for the assessment of the duty of 15 per cent. *ad valorem* of certain chemical auxiliary materials and products.

U.S. Tariff Investigation on Potassium Permanganate

THE United States Tariff Commission, pursuant to Section 315 of the Tariff Act of 1922 (the flexible tariff arrangement), held a public inquiry into the cost of potassium permanganate and kindred matters last week. Under the Act of 1922, potassium permanganate is dutiable at 4 cents per lb. The Tariff Commission has obtained costs of production from the I.G. factory at Bitterfeld, near Leipzig, the sole German manufacturers, and from the Carus Chemical Co., who since 1923 have been the sole manufacturers in the United States. The imports of potassium permanganate rose from a minimum of 4,000 lbs. in 1919 to a maximum of 1,121,613 lbs. in 1923. Germany is now the chief importer of this product into the United States.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

HAMMOND, William, and Co., Bridgwater Chambers, 6, Brown Street, Manchester, chemical merchants. (C.C., 28/4/28.) £20 6s. 9d. March 15.

KIRSCH, H., and Co., 105, Redman Road, Stepney, soap manufacturers' agent. (C.C., 28/4/28.) £81 14s. 5d. March 20.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

MACLEANS, LTD., London, N.W., manufacturers of toilet specialities. (M., 28/4/28.)—Reg. April 5, £500 debentures, part of £4,000; general charge. *£3,000. November 3, 1927.

Receivership

LANGWITH BYE-PRODUCT CO., LTD. (R., 28/4/28.) T. E. Haslam, Chartered Secretary, Sheepbridge Works, Chesterfield, was appointed Receiver on March 28, 1928, under powers contained in trust deed dated April 26, 1909.

London Gazette, &c.

Notice of Intended Dividend

PARCELL, Luther Livingstone, Wold Road, Barrow-on-Humber, Lincolnshire, soap and disinfectant manufacturer, trading as L. PARCELL AND CO. Last day for receiving proofs, May 9. Trustee, J. F. Wintringham, St. Mary's Chambers, Great Grimsby.

Partnership Dissolved

HAMILTON, SON, AND CO., Archibald Orr HAMILTON, George Alfred Gregg HAMILTON, and William Duguid REEKIE, chemical manufacturers, 80 Cornwall Street, Kinning Park, Glasgow, by the retiral of W. D. Reekie. The business will be carried on under the old name by A. O. Hamilton and G. A. G. Hamilton.

New Companies Registered

AGUAS BLANCAS NITRATE CO. (1928), LTD., River Place House, 10/11, Finsbury Circus, London, E.C.2. Registered as a "public" company on April 23. Nom. capital, £375,500 in 1,502,000 shares of 5s. each. The objects are to acquire the undertaking and properties of and assume and provide for the liabilities of the Aguas Blancas Nitrate Co., Ltd. (incorporated in 1909), to adopt an agreement with the said company and J. Featherstone, the liquidator thereof, to acquire any other nitrate grounds or other lands, properties and undertakings, whether in the Republic of Chile or elsewhere, where caliche or any other deposit from which any fertilising or other mercantile product can be manufactured or may be found, and also any lands in the said Republic or elsewhere under which any minerals, ores, or other substances are or may be found, to manufacture and bring to market all or any such deposits, minerals, ores or other substances and the products thereof, etc.; manufacturers and exporters of and dealers in nitrates, iodine and other products. Directors: T. T. Aikman, A. Fergusson, S. Ireland, G. T. Moody, W. J. Welch.

G. C. HURRELL AND CO., LTD., Old School Works, Woolwich Road, Charlton, London, S.E. Registered April 21. Nom. capital £2,500 in £1 shares. To acquire the business of a chemical plant manufacturer carried on by G. C. Hurrell as G. C. Hurrell and Co., at Old School Works, Woolwich Road, Charlton, London, S.E.

VITRUM, LTD. Registered April 24. Nom. capital, £100 in £1 shares. Bankers, capitalists, financiers, concessionaires and merchants. To acquire the right to use any inventions or secret or other processes relating to the production of activated carbon, ammonia or compounds of ammonia, acetone, cyanides, cyanamides or nitrates or any other products derived from peat, coal or coke or by-products of coal or refuse, or any carbonaceous or other substance, etc. A subscriber: F. J. Groombridge, 161, Winns Avenue, Walthamstow, London, E.17.

Helium from Natural Gas

New American Supplies

THE final closing of a contract with the Amarillo Oil Co., of Texas, which, it is thought, will greatly increase the available supply of helium, is announced by the United States Bureau of Mines, Department of Commerce. Under the terms of the contract, the Bureau will undertake the extraction of the helium from natural gas from the company's leases in Potter County, Texas, at a new helium plant to be constructed by the Government at Amarillo. The Bureau of Mines has had jurisdiction over production and conservation of helium for the U.S. War and Navy Departments since July 1, 1925. All the helium produced by the Government, to date, has been extracted from gas from the Petrolia field in Clay County, Texas, at the United States Helium Production Plant near Fort Worth, Texas. As this source of supply is no longer capable of meeting the demands of the War and Navy Departments, the Bureau of Mines has been working toward the development of other fields.

The Cliffside Structure has been found to be the most promising field upon which a new project for augmenting the production of helium might be based. Preparations are now being made for the erection of a helium plant near Amarillo to produce gas from the Cliffside Structure. The details of plant location and construction are not yet fully developed, but it is planned to develop a helium project at Amarillo which will be an important factor in national defence.

The helium will be recovered by cooling the gas to approximately 300° F. below zero, at which temperature all of the constituents of the gas, except the helium, are reduced to a liquid state. The helium will be drawn off as a gas at this low temperature and compressed into tank cars or steel cylinders for shipment to points where it will be used in lighter-than-air craft and for other purposes. The remaining liquid, consisting of the original gas minus the helium, will then be evaporated to the gaseous state and be delivered into the lines of the Amarillo Oil Co. for use as fuel.